PRACTICAL SURGERY ILLUSTRATED

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BY VICTOR PAUCHET

Translated by F R. B. ATKINSON M D, C.M (*Edin. Univ*) *With an Introduction by* SIR CHARLES GORDON-WATSON C M G, F R C.S. *Surgeon and Joint-Lecturer in Surgery, St Bartholomew's Hospital*

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GENERAL INTRODUCTION

THE reputation of Victor Pauchet as a bold and brilliant surgeon stands high in Paris

'Practical Surgery Illustrated, translated into English by Dr F R B Atkinson, cannot fail to enhance that reputation and will enable English surgeons to study Pauchet s methods in detail with both pleasure and profit

Practical Surgery Illustrated ' makes no claim to be a text book of operative surgery It claims rather to illustrate operations as practised by the author and these claims are well substantiated The illustrations are drawn from life the text explains them The author presents his methods in a series of living pictures in a manner which should appeal to the practical surgeon.

English surgeons will note with interest that local spinal, and splanchnic anæsthesia have practically supplanted general anæsthesia in Victor Pauchet s practice

C GORDON WATSON

INTRODUCTION TO VOLUME V

The Treatment of Trigeminal Neuralgia.—Pauchet holds that division of the sensory root behind the Gasserian ganglion is the treatment of choice for facial neuralgia He employs local anæsthesia for opening the skull, and a general anæsthetic for the principal stages of the operation He allows the patient to get up on the day after operation, and to return home on the eighth day

He employs a powerful bone perforator, and an electric light is attached to his brain retractor

Tumours of the Floor of the Mouth.—Pauchet performs a radical operation by the submaxillary route for inflammatory as well as malignant disease of the submaxillary gland and deliberately opens up the buccal cavity from the neck. He ties the external carotid between the superior thyroid and lingual arteries.

Diverticulum of the Œsophagus.—Pauchet advocates a two-stage operation, and performs a preliminary gastrostomy

The diverticulum is exposed and fixed to the omo-hyoid to avoid retraction, and then brought outside the wound, which is otherwise closed. It is removed at a later date

Biliary Surgery—Chapter IV deals with methods of repair for fistula of the common duct

Pauchet employs a rubber tube He opens the duodenum, stretches the ampulla, and then perforates it. The tube which has been fixed into the stump of the common duct is drawn through the duodenum Omentum is then wrapped round the line of junction.

The illustrations show clearly the method advocated. Three successful cases are related.

Gastro-Duodenal and Gastro-intestinal Surgery—Though this branch of surgery has been discussed in the first volume, the author returns to the subject to consider amongst other things methods of suture with special reference to Connel's and Cushing's stitches, as well as the problems arising from secondary jejunal ulcer and the varying indications for different methods of anastomosis after partial resections for gastric and duodenal ulcers It may be noted that Pauchet has resurrected Murphy's button for jejuno-jejunostomy in association with a long loop gastro-jejunostomy

Surgery of the Large Intestine—These chapters cover ground which has already been considered Methods of dealing with carcinoma

of the colon in varying situations, with or without obstruction, in good subjects and in bad, are thrashed out in detail, and can be well followed in the illustrations.

Large Scrotal Hernia.—Hernia has been discussed in Volume I In this chapter special and detailed consideration is given to large irreducible scrotal herniæ In the repair of the canal Pauchet makes use of the outer portion of the rectus sheath. The sheath is divided vertically midway between the midline and the outer border of the muscle, and the outer half is then turned outwards and sutured to Poupart's ligament.

Abdominal Hysterectomy for Suppuration of the Adnexa—Hysterectomy of the Fundus—Vaginal Closure for Prolapse in the Old —The difficult operation of complete abdominal hysterectomy for chronic suppuration of the tubes is described by Dr Gabriel Luquet.

To illustrate effectively an operation of this nature for double pyosalpynx with a pelvic abscess, complicated by adhesions to the bowel, is an accomplishment of some merit which redounds to the credit of the artist, Monsieur S Dupret. Partial hysterectomy for similar conditions is advocated for those who have not reached the menopause, and it is stated that the periods continue in 75 per cent. of the cases.

Closure of the vagina by dissecting off a rectangular flap of mucosa from *anterior and posterior* walls is advocated for serious prolapse in the old A lateral channel is left on either side to allow the escape of cervical secretions.

C GORDON WATSON

March, 1925.

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I

THE TREATMENT OF TRIGEMINAL NEURALGIA

By Dr. Th. de Martel

Idiopathic neuralgia of the trigeminus has characteristic signs the patient has generally passed the age of forty, without apparent cause, very acute pains occur in the area supplied by the trigeminus, generally localised at the commencement to the region of only one or two of its branches

The pains arise in paroxysms with very marked exacerbations

They are separated by periods of quiescence, at first very long then shorter and shorter

They are much more frequently situated on the right than on the left side

They are of extreme violence

There are no objective sensory disorders in the region of the trigeminus There often exist vaso-motor and secretory disturbances in the same area

Neurotomy behind the Gasserian ganglion, and division of the sensory root of the trigeminus between the Gasserian ganglion and the pons constitute without possible dispute, the treatment of choice for facial neuralgia

This operation consists of—

1. Opening the skull above the ear
2. Separation of the dura mater from the base of the skull, and exploration for the crest of the petrous portion of the temporal bone and for the foramen ovale
3. Exposing between these two points the interior and exterior border of the Gasserian ganglion and the sensory root
4. Division of the root
5. Suture of the soft parts

Position of the Patient—The head should be raised

Anæsthesia—General anæsthesia is necessary for the principal stages of the operation, exposure and division of the nerve

Local anæsthesia is amply sufficient for opening the skull

I use ether as a general anæsthetic novocaine 1 200 for local anæsthesia

Record of the Arterial Tension —It is a good thing during operation, as during any serious surgical intervention, to take often the patient s arterial tension and to note it carefully Generally the arterial tension is well maintained from one end of the operation to the other If however, it be abnormally lowered, there should be no hesitation in operating in two *stages* and in *postponing* the rest of the operation until some days later

Incision —Curvilinear in a half circle above the ear

Incise down to the bone and turn down the musculo-cutaneous flap

Stop all bleeding from the borders of the flap with T forceps

Arrest the hæmorrhage from the temporal arteries with Kocher s forceps and immediate ligature to make the operative field clear

Stop up the perforating arteries with wax, if they be small with ends of bone if they be large

Trephining —Perforate the bone with any kind of trephine in the centre of the exposed surface

Enlarge the perforation by gouge forceps as much as possible below, on the horizontal portion of the temporal bone

Behind cease using the forceps at the base of the anterior endo-cranial surface of the petrous portion of the temporal bone

Complications —*A* Hæmorrhage from laceration of the meninges which are adherent to the bone

B Opening the dura mater, which is sometimes very adherent

Work with great gentleness and care If the meningeal artery be lacerated tie it above and below the bleeding point with a thread passed by means of a fine curved needle

If the dura mater be torn, stop up the tear with a piece of muscle introduced between the brain and the dura mater, fixed by two stitches

Tearing the dura mater aggravates the operation The cerebro-spinal fluid discharges, and no longer protects the base of the brain from the retractor

Separate the dura mater from the base of the skull as far as the tubercle of Princeteau behind up to the foramen spinosum in front

Proceed with great care

Begin at the posterior part of the opening in the bone

Lay bare gently the anterior endo-cranial surface of the petrous portion of the temporal bone, continuing the separation internally and in front

Note in turn

1 The eminentia arcuata (rounded mammillated prominence answering to the superior semicircular canal)

2 A broad depression following the prominence of the eminentia arcuata

3 The tubercle of Princeteau, on the crest of the petrous portion of the temporal bone It is immediately inside this tubercle that the root of the trigeminus passes directly it leaves its bed in the cerebellum it reaches beyond the upper border of the petrous portion of the temporal bone under the superior petrosal sinus to penetrate into the middle part of the cranium, and spreads out as a fan between the two layers of the dura mater, separated into two to form the cavum of Meckel

Having first separated the dura mater from the petrous portion of the temporal bone up to the tubercle of Princeteau, then detach it from the horizontal portion of the shell of the temporal bone up to the foramen spinosum, if it has not already been done

Mark out the foramen spinosum by introducing a strabismus hook into it and pack it full with cotton wool so as to produce hæmostasis of the central end of the middle meningeal artery (Frazer) Then prolong the dissection as far as the foramen ovale, and discover its antero-external semi-circumference by means of a strabismus hook.

Knowing the position of the foramen ovale and the tubercle of Princeteau, make a mental note of the direction of the inferior border of the Gasserian ganglion and of its sensory branch

Incise with a fine knife, along the antero-external border of the foramen ovale, the sheath the dura mater forms for the inferior maxillary nerve

Pull back the sheath upwards and behind towards the tubercle of Princeteau with the back of the strabismus hook

Note the bundles of the inferior maxillary nerve which are quite visible

Introduce the strabismus hook into the turned up nervous sheath and tear it, exposing the interior and exterior edges of the ganglion

During this procedure watch carefully for the appearance of the large white sensory root of the trigeminus and where, at the same time, the cerebro-spinal fluid discharges

Divide the root with a knife or by means of a small special instrument

If this manœuvre be impracticable, as it sometimes is, be content to introduce the strabismus hook under the root and detach it from the pons with great gentleness

During the whole of this operation, use a retractor with electric light or a frontal light

Hæmorrhage is very abundant and very troublesome The surgeon must use, according to circumstances, tampons or aspiration

Sequelæ —They are very simple The patients can generally get up the day after the operation, and return home in eight days

Immediately after the operation abolition of the corneal reflex is observed, and very marked anæsthesia of the whole of the area supplied by the trigeminus. It must be searched for by very slight pricking, or by effleurage with a thin tampon of cotton wool The anæsthesia diminishes by degrees as the date of the operation becomes more distant

The contraction of the anæsthetic zone occurs at the external limit of its circumference, the internal nasal boundary of the anæs thetic zone remaining unaltered

Complications —There is only one peripheral facial paralysis on the operated side, when the trigeminus has been roughly torn.

It is for that reason that it is necessary either to detach it from the pons by very gentle traction, or, still better to divide it with a small special instrument Sometimes paralysis of the sixth pair is observed.

Generally commence treatment by alcoholisation of the nervous branches, according to the procedure of Beaudoin and Lévy, and especially for the purposes of diagnosis If the patient be alleviated by alcoholisation, await the first recurrence, and then perform without fear neurotomy behind the Gasserian ganglion

In patients who have received many injections of alcohol, some nervous changes have been already produced and there is no neces sity to wait for complete anæsthesia of the whole of the region supplied by the trigeminus to be obtained when injecting the anæsthetic

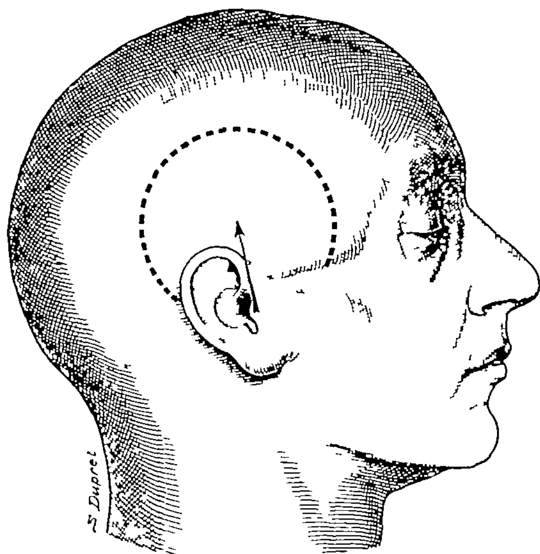


FIG 1.—TREATMENT OF TRIGEMINAL NEURALGIA.

Curvilinear incision. The middle of the base of the flap marked by an arrow answers to the tragus.

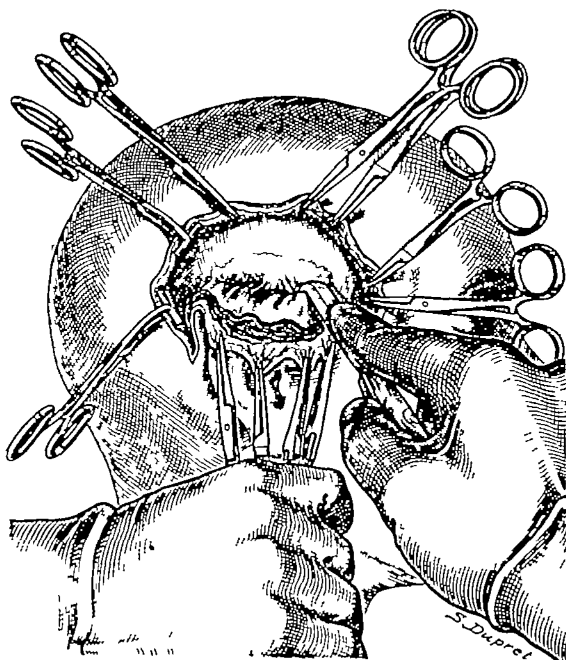


FIG 3.—TREATMENT OF TRIGEMINAL NEURALGIA.

Separation of the temporal muscle by the rugine. A cutaneous flap may be cut at the same place but distinctly smaller In this case it was sufficient to pass between the fibres of the temporal muscle and to separate them.

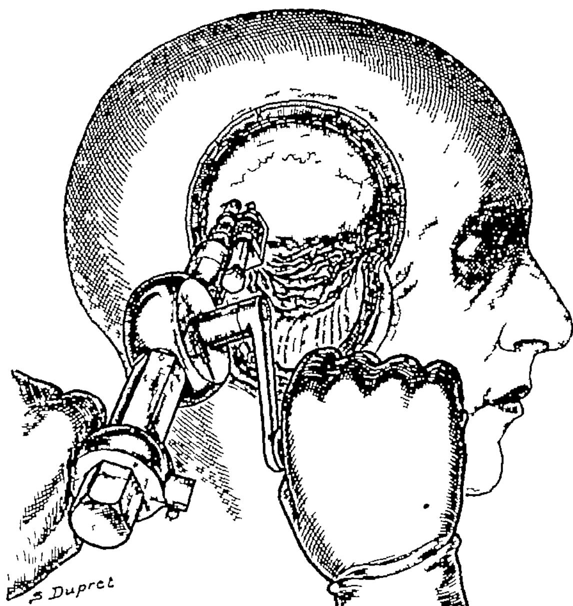


Fig 4.—Treatment of Trigeminal Neuralgia.
Perforation of the bone with my hand perforator

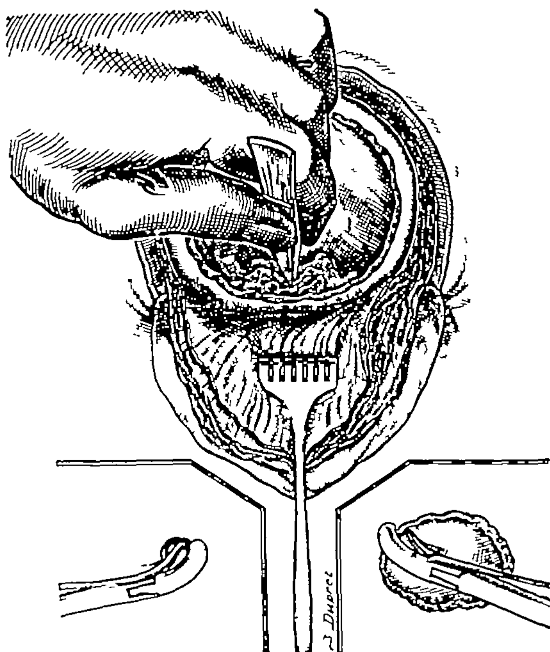


FIG 5.—TREATMENT OF TRIGEMINAL NEURALGIA.

Separation of the dura mater from the base of the skull by pressing down a compress firmly

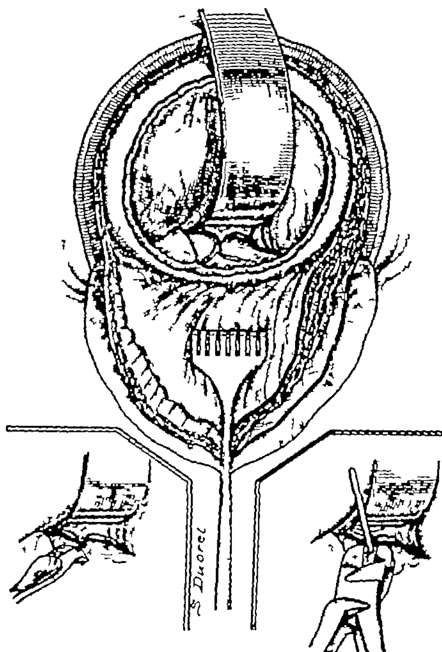


Fig 6.—Treatment of Trigeminal Neuralgia.

The flexible retractor (which may have an electric light) pushes back and raises the brain. The meningeal artery which becomes stretched, is visible. The eminentia arcuata is well seen behind. At the left, the meningeal artery is cut with one stroke of the rugine. On the right plugging the opening of the meningeal artery by a piece of bone cut away close to the skull.

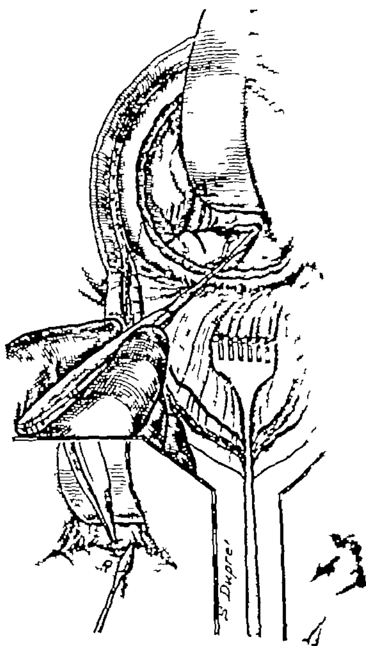


FIG. —TREATMENT OF TRIGEMIN...

Incision of the dura mater along the external border ... right the sheath of the dura mater pushed back al... Gasserian ganglion is seen.

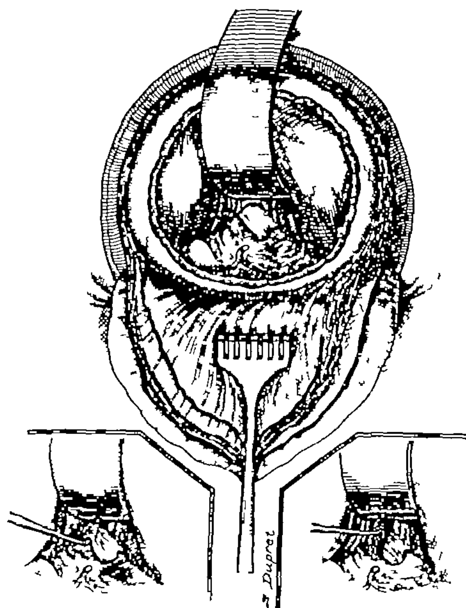


Fig 8.—Treatment of Trigeminal Neuralgia.

e operation is nearly finished. The root is visible. On the left the root is caught by a hook; it only remains to cut it or to tear it out. On the right, tearing out the root by gentle traction.

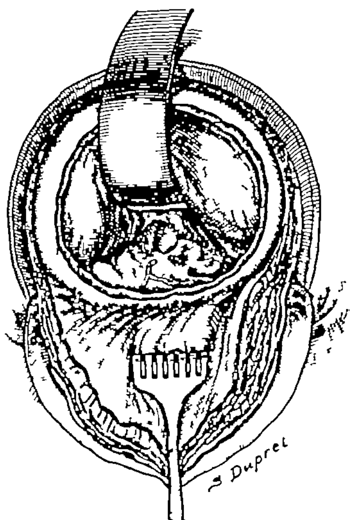


Fig. 9.—Treatment of Trigeminal Neuralgia.

The root is torn out. The nervous bundles broken and separated are visible.

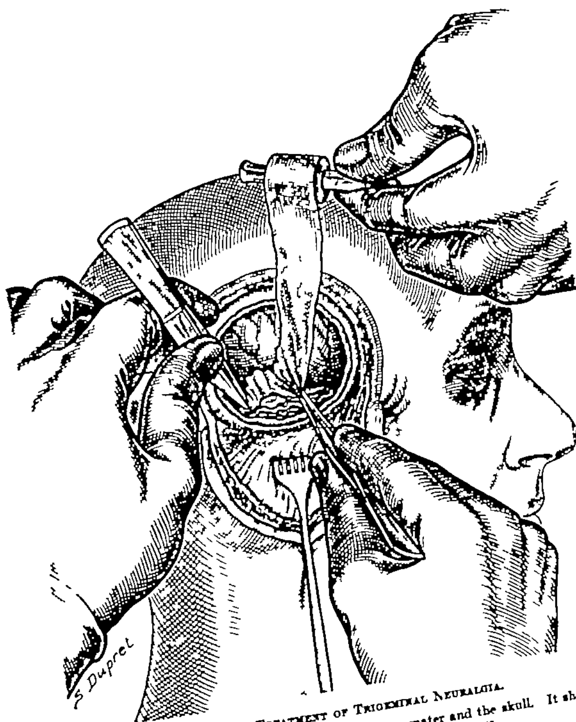


Fig. 10.—Treatment of Trigeminal Neuralgia.
A drain is lightly pushed down between the dura mater and the skull. It should be withdrawn at the end of twenty four hours.

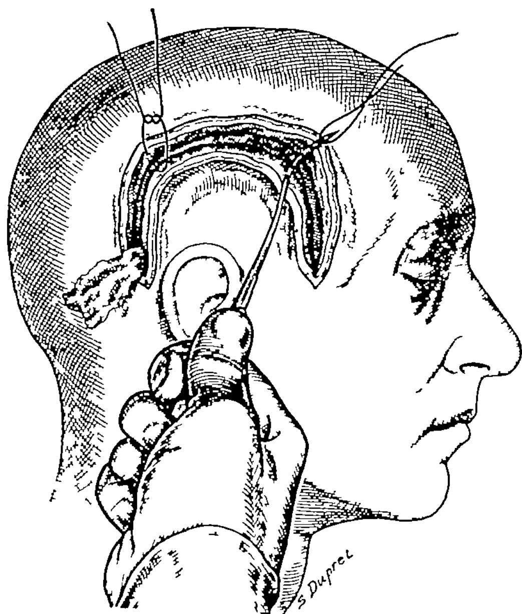


FIG 11 —TREATMENT OF TRIGEMINAL NEURALGIA.
Suture of the epicranium by interrupted stitches of catgut

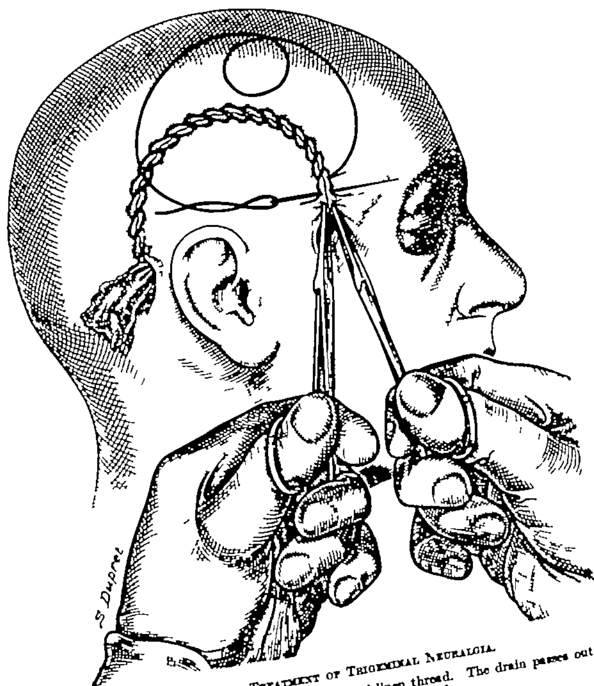


FIG 12.—TREATMENT OF TRIGEMINAL NEURALGIA.

Suture of the skin by a continuous suture of linen thread. The drain passes out at the posterior angle of the wound.

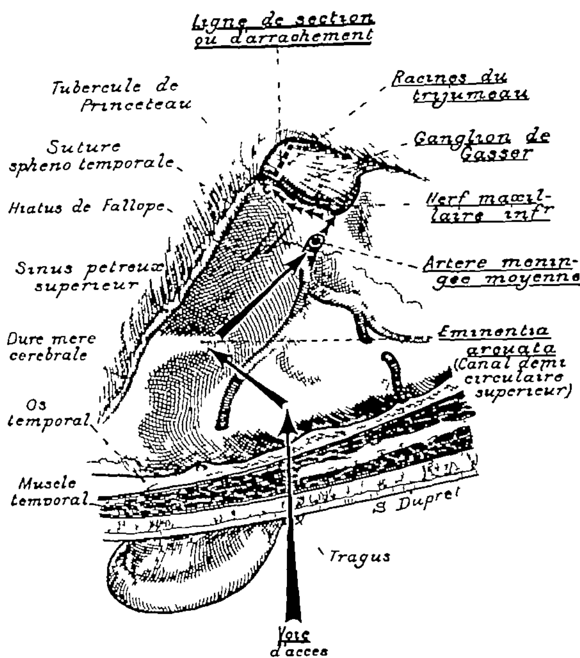


FIG 13 —TREATMENT OF TRIGEMINAL NEURALGIA.

Bird's-eye view of the field of operation.

Tubercule de Princeteau = Tubercle of Princeteau *Ligne de section ou d'arrachement* = Line of incision or of extraction. *Racines du trijumeau* = Roots of the trigeminus *Suture sphéno-temporale* = Spheno-temporal suture *Ganglion de Gasser* = Gasserian ganglion *Hiatus de Fallope* = Hiatus of Fallopius *Nerf maxillaire infr* = Inferior maxillary nerve *Sinus petreux supérieur* = Superior petrosal sinus *Artère méningée moyenne* = Middle meningeal artery *Dure-mère cérébrale* = Cerebral dura mater *Eminentia arcuata (Canal demicirculaire supérieur)* = Eminentia arcuata (Superior semicircular canal.) *Os temporal* = Temporal bone *Muscle temporal* = Temporal muscle *Tragus* = Tragus *Voie d'accès* = Way of approach.

II
TUMOURS OF THE FLOOR OF THE MOUTH

EVERY affection of the floor of the mouth, the site of which is more outside the middle line than median, should, at first, suggest an affection of the salivary glands The sublingual gland occupies the anterior part of the floor of the mouth, whilst the submaxillary gland is not an organ which belongs to the buccal cavity, but to the lateral suprahyoid region Only Wharton s duct belongs to the floor of the mouth, seeing that it crosses the mylo-hyoid muscle, a kind of diaphragm separating the floor of the buccal cavity from the suprahyoid region Wharton s duct follows the lower surface of the sublingual gland, to which it is adherent, it is found, therefore, below the sublingual gland accompanied by the lingual vein and lingual nerve A calculus in the duct itself will protrude into the buccal floor and be felt by the finger through the buccal mucosa This fact is important in practice, because in the cases where we have to deal only with a calculus in Wharton s duct or, what is rarer with inflammation or a concretion in the sublingual gland, it is logical to intervene by the buccal route, a simple incision will be sufficient then to extract a stone or to open the suppurating sublingual gland

Operation by the mouth avoids with certainty the inconvenience of a salivary fistula which is frequently observed after operations of this kind by the suprahyoid route

The clinical appearance and the therapeutical indication change when the affection—a calculus, or inflammation or a growth—develops in the submaxillary gland itself The swelling shows its presence below the jaw and the technique of the operation in similar cases becomes quite different This we will now describe, we have followed it in the case which has served as a model for our drawings

The method can be applied to all the affections of the floor of the mouth which extend to the submaxillary gland itself or to the glands which surround it, and are found in the fibrous bed of the submaxillary gland in contact with the glandular parenchyma Such is the case in cancerous affections of the tongue when the

glands of the submaxillary region are generally invaded, as also in chronic inflammations of the submaxillary gland—chronic sub maxillary sialo-lithiasis and sialo-adenitis

SYMPTOMATOLOGY —When a unilateral swelling outside the middle line of the floor of the mouth is found it generally means an affection of the salivary glands, the swelling may be a new growth, which is indeed very rare, or, what is commoner inflam matory The organ which is most particularly affected or accessible to infections and complications of the buccal floor is the sub maxillary gland, it is more frequently attacked than the sublingual gland, and it is noticeable nearly all the patients (80 per cent) belong to the masculine sex. The affection generally ascends—*i.e.*, inflammation of Wharton's duct, then of the submaxillary gland, the clinical process therefore presents a certain analogy to biliary lithiasis The calculous concretions are secondary to the infection If calculi be often found in Wharton's duct, which passes into the buccal floor they can easily be felt by the finger introduced under the tongue If the stones, or inflammation, affect at the same time the submaxillary gland the latter protrudes in the lateral subhyoid region

The treatment to be followed in like cases is extirpation of the submaxillary gland, and if necessary also of the sublingual gland and of the floor of the mouth The same procedure is moreover, to be followed in cases of tumour—epithelioma primary sarcoma adenoma or chondroma—which have been exceptionally observed in the submaxillary glands

The submaxillary gland is surrounded by numerous glands, and when they become swollen they form in the suprahyoid region a protrusion sometimes infiltrating so extensively that it can easily be confounded with the gland itself. This explains the view of Velpeau, who considered the gland was never removed, but only the glands concealing it

DIFFERENTIAL DIAGNOSIS —The presence of a calculus is con firmed by repeated attacks of pain in the salivary glands analogous to hepatic or to renal colic, afterwards by excessive salivation at the end of one of the attacks In cases of calculus in Wharton's duct, by introducing a probe into the duct, we alight on the calculus Lastly the calculi are easily accessible to radiography

As regards the inflammatory exacerbations with or without calculi, they are revealed excluding rises of temperature by the

presence at the opening of Wharton's duct of a drop of pus from pressure on the buccal floor

In chronic inflammatory affections of the submaxillary gland a board like infiltration of the subhyoid region is sometimes noted

Histological examination, in cases of chronic inflammation of the submaxillary gland, generally shows all the signs of an atrophic and progressive glandular fibrosis

In cases of malignant operable growths the patients should be submitted *to applications of deep radiotherapy after* the operation The field of the rays should especially include the lateral suprahyoid region

If the tumour be inoperable the treatment is only by X rays or by radium, and only after the use of the X rays, if the condition has become operable as a result of regression and partial destruction of the invaded tissue, it may be accessible to the knife

TECHNIQUE OF THE OPERATION —This should be the same in cases where a tumour or a chronic inflammatory affection of the salivary glands protrudes under the floor of the mouth and into the lateral suprahyoid region

1. Make an *incision* beginning two fingers breadth below the lobe of the ear, 1 centimetre outside the internal border of the sterno-cleido-mastoid, and one parallel to the border of this muscle three fingers' breadth above its sterno-clavicular insertion Divide the subcutaneous cellular tissue, and also the sheath of the sterno-cleido-mastoid, pull back the muscle, deprived of its sheath Expose and divide the thyro-linguo-facial venous trunk Cut the middle cervical aponeurosis retracting at the same time the sterno-cleido-mastoid posteriorly, expose the internal and external carotid arteries with their branches The external carotid artery is recognised by its numerous branches, notably the superior thyroid, tie it between the thyroid and lingual artery This preventive ligature wards off excessive hæmorrhage during operation.

The operator sees the descending branch of the hypoglossal nerve crossing obliquely the internal and external carotid and passing to the floor of the mouth, it runs behind the posterior belly of the digastric and behind the submaxillary gland

2. *Freely expose the submaxillary gland* by a square-shaped incision, branching from the first—*i.e.*, perpendicularly to it It should end at the inferior border of the jaw, at the chin. Then reflect the two cutaneous flaps, dissecting them with the knife, the upper one close to the jaw, the lower as much as necessary to expose

the whole region of the hyoid bone and of the bed of the submaxillary gland

3 *Clear out the Cavity of the Submaxillary Gland* —Remove the submaxillary gland and glands around it Proceed by enucleation from above downwards, do not injure the external carotid and the internal jugular vein, which are separated a short distance from the posterior extremity of the gland, they are often surrounded by a more or less thick chain of glands

4. *Examine the Floor of the Submaxillary Cavity* —The cavity is formed by the two bellies of the digastric on the one hand, and by the lower border of the maxilla on the other The floor of this cavity is formed by the hyo-glossus and the mylo-hyoid muscles After ligature of the facial artery, close to the maxilla, incise the mylo-hyoid muscle transversely and parallel to the edge of the maxilla and a distance of 1 to 2 centimetres from it The mylo-hyoid muscle being cut the buccal floor is opened The organs of the buccal floor, properly so called—*i.e.*, the sublingual gland and Wharton s duct—are exposed to view

5 *Draw the tongue below the maxilla* into the operative field We have now to free it from the mass of tissues on which the new growth or the inflammatory glandular mass rests For this purpose it is necessary to incise it from its root to the frænum separating *en bloc* the sublingual gland and Wharton s duct, which adhere to its deep surface This method gives a large excision, and in cases of a new growth is the best guarantee of not leaving the invaded tissue

6 *Replace the tongue* into the mouth and dissect the mass which includes the organs contained in the buccal floor, the sub maxillary and sublingual mass with the submaxillary and carotid glands joined by the middle cervical aponeurosis

7 *Suture the floor of the mouth*

8 *Suture the posterior belly of the digastric* muscle with th sterno-cleido-mastoid suture the sterno-hyoid and thyro hyoi in the subhyoid part

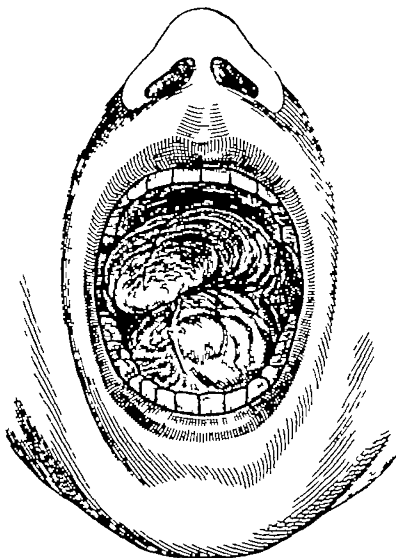


FIG. 14.—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

This tumour has developed in the salivary glands, the sublingual and the submaxillary. Its growth and appearance were those of a neoplasm. In reality the tumour was inflammatory as histological examination showed.

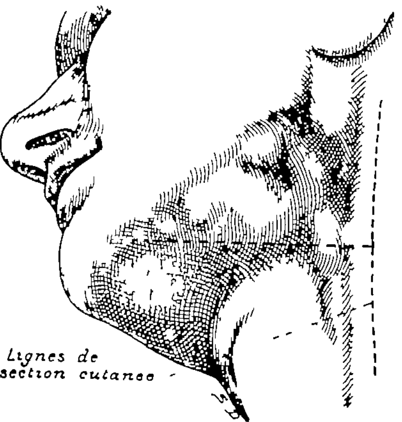


Fig 15.—Tumour of the Floor of the Mouth. Removal.

Appearance of the tumour in the cervical and submaxillary region. Cervical adenopathy under the skin a nodular and hard prominence formed by the submaxillary gland. The dotted line shows the incisions.

Lignes de section cutanée = Lines of the cutaneous incision

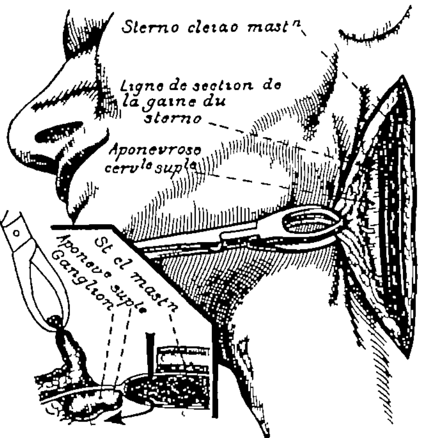


Fig 16.—Tumour of the Floor of the Mouth. Removal.

Incision of the skin and of the cervical aponeurosis. The dotted line is parallel to the anterior border of the sterno-mastoid. Below the figure, and to the left, the arrow indicates the direction of the knife.

Sterno-cléido-mastn. = Sterno-cleido mastoid *Ligne de section de la gaine du sterno* = Line of incision of the sheath of the sterno-cleido-mastoid *Aponévrose cervle. suple.* = Superficial cervical aponeurosis *Ganglion* = Gland.

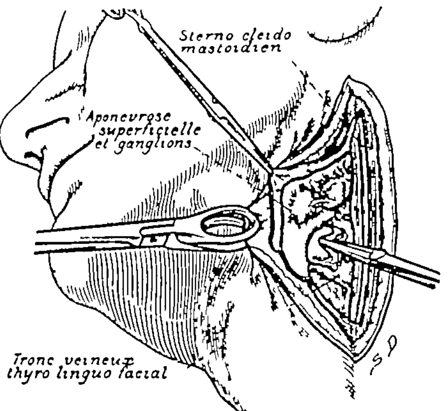


FIG 17—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

The first stage of the operation consists in dividing the aponeurosis and retracting the cellular tissue of the cervical region with the glands contained in its substance. This manœuvre is made sometimes by the compress and sometimes by the knife The glands and the aponeurosis above and in front

Sterno-cleido-mastoidien = Sterno-cleido mastoid *Aponévrose superficielle et ganglions* = Superficial aponeurosis and glands *Tronc veineux thyro-linguo facial* = Thyro linguo-facial venous trunk.

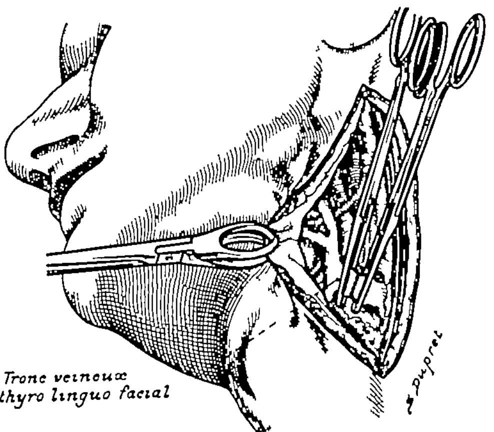


FIG 18—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

The dissection lays bare the thyro-linguo-facial trunk It is divided and tied

Tronc veineux thyro-linguo-facial = Thyro-linguo facial venous trunk.

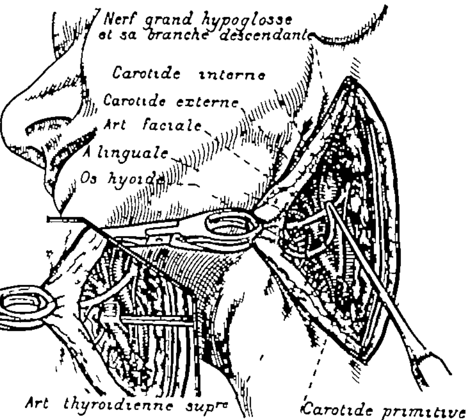


FIG 10 —TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

The cellular and glandular mass dissected and retracted allows the operator to see the external carotid. It is recognisable by the prominence of the hyoid bone or by the hypoglossal nerve and by its collateral branches. The artery is tied.

Nerf grand hypoglosse et sa branche descendante = Hypoglossal nerve and its descending branch *Carotide interne* = Internal carotid. *Carotide externe* = External carotid. *Art faciale* = Facial artery *A linguale* = Lingual artery *Os hyoide* = Hyoid bone *Art. thyroidienne supre.* = Superior thyroid artery *Carotide primitive* = Common carotid

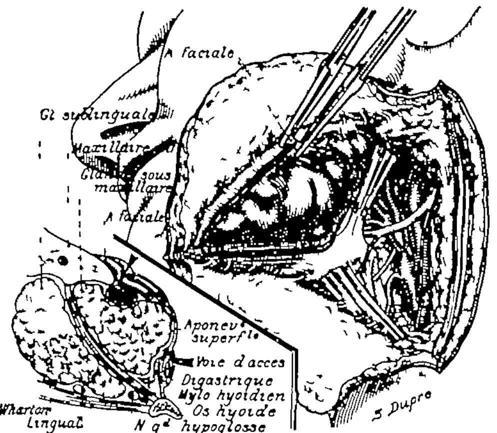


FIG 20 —TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

By retraction and dissection, the cellular and glandular mass has been pushed upwards. The operator incises the cervical aponeurosis on the inferior border of the maxilla, and over the belly of the digastric muscle.

A faciale = Facial artery *Gl sublinguale* = Sublingual gland *Maxillaire inf* = Inferior maxilla. *Glande sous-maxillaire* = Submaxillary gland *Aponévre superfle.* = Superficial aponeurosis *Voie d'accès* = Route of access *Digastrique* = Digastric *Mylo-hyoïdien* = Mylo-hyoid *Os hyoide* = Hyoid bone *Wharton* = Wharton's duct *Lingual* = Lingual duct *N gd. hypoglosse* = Hypoglossal nerve

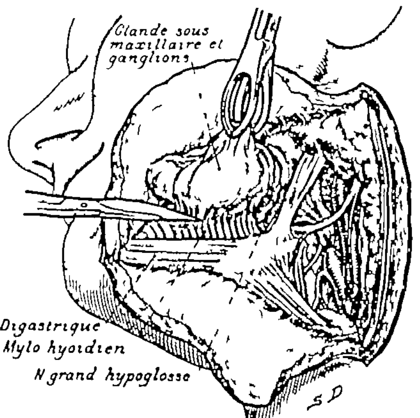


FIG 21 —TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL (*continued*)

Glande sous maxillaire et ganglions = Submaxillary gland and glands *Digastrique* = Digastric *Mylo-hyoidien* = Mylo-hyoid. *N grand hypoglosse* = Hypoglossal nerve

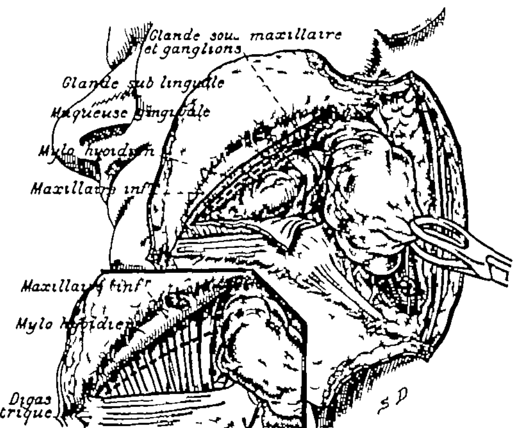


FIG 22 —TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

After liberation of the hypertrophied and hard submaxillary gland the operator sees its prolongation under the mylo-hyoid muscle. Note, below the incision of the mylo-hyoid muscle, and above, the prominence of the mass continued by the sublingual gland which is also hard and large.

Glande sous-maxillaire et ganglions = Submaxillary gland and glands *Glande sub-linguale* = Sublingual gland *Muqueuse gingivale* = Buccal mucosa *Mylo hyoidien* = Mylo hyoid *Maxillaire infr* = Inferior maxilla *Digastrique* = Digastric

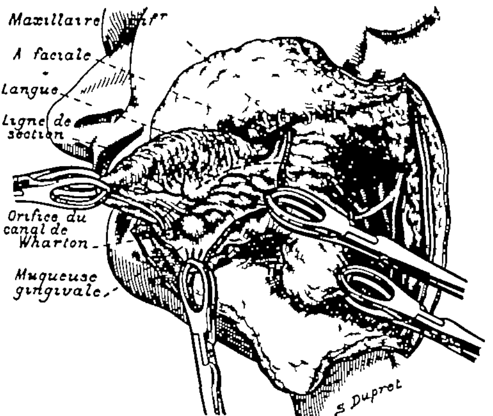


FIG 23.—TUMOUR OF THE FLOOR OF THE MOUTH REMOVAL.

The sublingual mass is adherent to the mucosa as the possibility of a new growth is feared, the mucosa will be excised. The tongue is drawn into the operative field. The dotted line indicates the point where the adherent mucosa will be divided

Maxillaire i fr = Inferior maxilla *A faciale* = Facial artery *Langue* = Tongue *Ligne de section* = Line of incision *Orifice du canal de Wharton* = Opening of Wharton's duct *Muqueuse gingivale* = Buccal mucosa

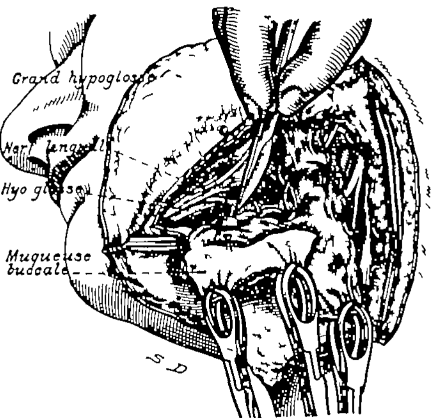


FIG 24.—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

The flap of the buccal mucosa is seized by two tissue forceps. It is drawn below whilst the knife continues to dissect the deep surface of the mass adherent to the hyo-glossus muscle The tongue has been returned into the mouth.

Grand hypoglosse = Hypoglossal *Nerf lingual* = Lingual nerve *Hyo-glosse* = Hyo-glossus *Muqueuse buccale* = Buccal mucosa

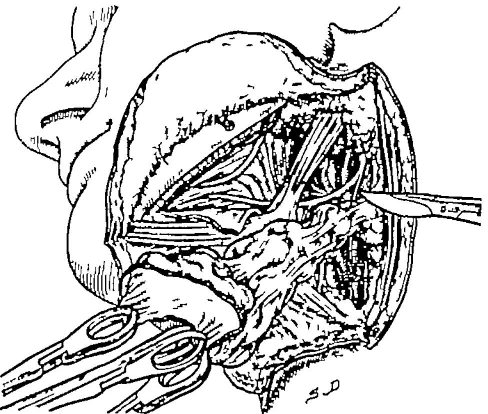


FIG 25.—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

The sublingual the submaxillary as also the glands which have been *retracted at the beginning of the operation, form one mass,* continued by some tracts of cellular tissue, which still bind the glandular mass to the cervical aponeurosis.

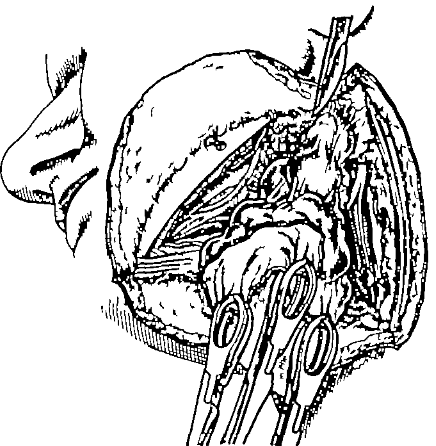


FIG 26.—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

Division of the fibrous tracts, which unite the peri glandular mass to the parotid.

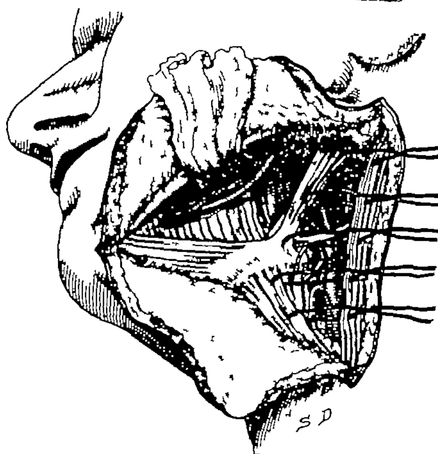


FIG 27.—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL (*concluded*)

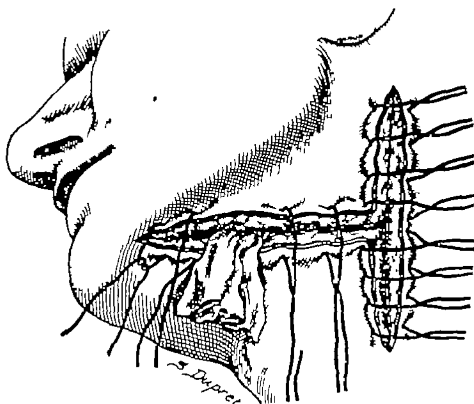


FIG 28.—TUMOUR OF THE FLOOR OF THE MOUTH. REMOVAL.

The wound *has been washed in ether* *A small drain is introduced between the edges* of the skin. This drain joins the suture of the buccal floor but does not pass into the cavity of the mouth. The skin is sutured by interrupted linen thread stitches.

III

DIVERTICULUM OF THE ŒSOPHAGUS

THERE are two varieties

Pharyngo-œsophageal, situated at the entrance to the œsophagus, and forming a perfectly distinct morbid entity, pathogenically, clinically, and therapeutically

Œsophageal, properly so-called, situated on the other parts of the œsophagus, and which include, viewed anatomically and pathogenically, dissimilar dilatations They are difficult to recognise in the living subject Their diagnosis as well as their treatment, are surrounded by difficulties

We will study here the pharyngo-œsophageal diverticula

These take their origin on the posterior wall of the pharyngo-œsophageal canal just below the upper opening of the œsophagus They are probably of mechanical origin, the pressure exercised by the bolus of food on the pharyngo-œsophageal wall, which is either congenitally or spasmodically contracted, in the long run leads to its compression at its weakest point Little by little a true hernia forms which protrudes between the transverse and ascending bundle of the crico-pharyngeal muscle (Bensaude and Grégoire) *

CLINICAL DIAGNOSIS —Diverticula are preceded for years by prodromata which consist in slight difficulty in swallowing and symptoms of pharyngeal irritation a scraping sensation and dryness of the pharynx abundant salivation, expulsion of mucus, attacks of coughing the sensation of a foreign body, etc It is exceptional for the affection to show itself suddenly

The symptoms appear only if the diverticulum reach a certain size They are due either to passage of the food into the cavity, or to the pressure which the pocket filled with food and secretions, exercises on the œsophagus and on the neighbouring organs

Some patients complain of a sensation as if the food stopped on its way they localise it behind the larynx then lower in the thorax as the pocket gradually dilates Only the larger particles of food

* "Archives des maladies de l appareil digestif et de la nutrition (Bensaude and Gregoire Vol. XII)

are arrested at the commencement, later the patients *experience* difficulty in swallowing the small pieces, and finally even liquids fail to pass The dysphagia varies according to the site and size of the diverticulum *Sometimes the first* mouthfuls are arrested and the following pass, sometimes the reverse, the patient eats slowly and carefully, he helps deglutition of the bolus by bending the body in different directions without result One morsel may pass without *difficulty* and the *next* be arrested There may be true rumination, the undigested food returning many times into the mouth before being finally swallowed

The patients have a sensation of a bad taste in the mouth The *stoppage of the food* may be *complicated* with a sensation of choking, and with congestion of the face, due to blocking of the œsophagus (Bensaude and Grégoire) This occurs intermittently during meals The patient cannot then swallow what is in the mouth, if he *persist* in the *attempt retro-sternal pain*, with a feeling of choking, arises The face becomes congested, and the patient gets up from the table to regurgitate the food that has been swallowed If he delay to regurgitate it, vertigo may occur

Spontaneous *regurgitation* of *food* is a *constant symptom.* The contents are not evacuated at one time only, but at many Sometimes the contents include food swallowed at a previous meal The regurgitated food is not *altered* and contains no trace of *hydrochloric* acid It is bathed in mucus

The diverticulum sometimes, when it is full, produces a bulging in the neck, met with in one-third of the cases, to bring it into prominence the head *must be extended.*

The swelling may occupy the two fossæ of the clavicle generally it is unilateral the size of the tumour is that of an egg or a pear It changes in size according to the amount of food it contains *After meals regurgitation causes it to get less or to disappear*

Percussion sometimes reveals a dull inferior part and a sonorous superior zone These areas, perceptible during meals, disappear afterwards

On palpation the tumour is soft and fluctuating It diminishes under pressure On swallowing it may be accompanied by movements of the larynx On expressing the contents *of the tumour* eructations or *borborygmi may* be produced. The latter is due to the diverticulum containing air, it is sometimes the first symptom of a diverticulum When, after an injection of water *lateral* pressure is *exercised* on *the neck, auscultation* reveals a gurgling

sound Succussion sound may even be produced on fasting in the morning after swallowing a glass of water

When the diverticulum is incompletely empty there is a pronounced fœtid odour in the breath, a symptom as unpleasant for the patient as for those around him

Sometimes the following signs of compression are observed dyspnœa, congestion of the face, cervical, brachial, thoracic and interscapular neuralgia, a raucous voice and oculo-pupillary signs from pressure on the sympathetic

Errors in diagnosis are frequent, sometimes the diverticulum is taken for stenosis from cancer of the œsophagus, which may be accompanied by heaviness behind the sternum and with a cervical tumour, giving on pressure the sensation of a soft swelling

The general signs of cancer are hardly of any use for diagnostic purposes, because the majority of diverticula are only recognised between forty and sixty years of age The history of the patient is very useful, it must reveal in a precise manner the evolution of the *symptoms* If the duration be long, with very long standing prodromata, if the development of the dyspnœa be slow and progressive, we can conclude a diverticulum exists

CATHETERISATION —This should be carried out fasting and never without the control of the eye If radioscopy cannot precede the use of a catheter, begin by making use of a conducting thread (Bensaude and Grégoire) A thread, when swallowed, passes down even a contracted œsophagus, and then enters the stomach and intestine, and becomes fixed there so that it cannot be withdrawn by traction This thread acts as a guide for a perforated olivary bougie it is made of resistant silk (twist) coated with wax Many metres of a thread are placed on the root of the tongue and swallowed with a mouthful of water at the end of twenty four hours the swallowed end is fixed in the intestine and resists all traction If it has not passed beyond the stomach it is easily withdrawn It crosses tight strictures, especially if belladonna be given. Once it is fixed the upper end is passed into the opening at the end of the catheter Catheterisation is performed without risk, for the instrument follows the lumen of the œsophagus, however narrow and defective it may be (Bensaude and Grégoire) The self retaining catheter allows us to recognise the opening and site of the diverticulum the entrance and the ledge (Guisez) are always posterior to enter into the œsophagus the catheter is turned forward to penetrate into the diverticulum it is turned backwards

The catheter introduced into the diverticulum is not caught as in the stricture, it feels as if it were in a free space

Radioscopy —The patient should be examined *successively* in different positions—oblique lateral, latero posterior The lying down position reveals the relationship of the diverticulum with the œsophagus, because the opaque meal is *slower in its passage* down the œsophagus The patient should fast and the opaque mixture then swallowed The diverticulum is seen to fill under the screen, this occurs from above downwards the opaque substance *descending from* the pharynx into the diverticulum without penetrating into the œsophagus, and accumulates rapidly The size of the diverticulum varies from a nut to a large orange

A full meal gradually expands the diverticulum, showing it is capable of great distension. This special sign ought to be looked *for* *The image presents an oval form with regular outline It has* one base with no prolongation below at the upper part a clear zone often appears, due to a bubble of air

The position is constant, the sac is situated in the cervical region behind the œsophageal tube, in the pre-vertebral space When it *has reached a certain degree of development its base descends into* the mediastinum, and may reach the bifurcation of the bronchi The diverticulum at first protrudes from the œsophagus and is seen on one of its lateral surfaces This was the case in the patient who has served as an example for the annexed figures

The diverticulum empties and fills by its upper part

The diverticulum being full the œsophagus must be brought into view by a new meal of barium The opaque *substance passes* quickly along the œsophageal walls, and leaves no adherent particles, as occurs in cases of dilatation above a stenosis due to cancer The œsophagus is not visible when it is *contracted* and compressed by a large diverticulum On compressing the diverticulum with the fingers the *opaque substance* can be driven into the pharynx and a fragment of it can be made to pass into the œsophagus.

Catheterisation should be performed by a self retaining catheter under control of the screen the path of the œsophagus being thus *made* visible it is possible to be certain if the pocket be rooted in the postero-superior part of the œsophagus and if the diverticulum be certainly a pharyngo-œsophageal one

Do not mistake diverticula for dilatations produced above a stricture or above a cancer *In both these cases* the dilatation

shows at its lower part an irregular, ragged outline, due to infiltration by the neoplasm

Spasmodic stricture may also be taken erroneously for a diverticulum Each time, owing to difficulties in interpetration there is a doubt as to the nature of the image, the diagnosis should be in favour of a diverticulum if connections with the œsophagus can be noted and its insertion, posterior to the junction of the pharynx and the œsophagus, be verified

ŒSOPHAGOSCOPY —We do not enter into details on the technique often described by Guisez, it ought to be carried out by a specialist, he should seek for the superior opening of the œsophagus, and near to it the opening of the diverticulum the latter is behind, the opening of the œsophagus is in front against the cricoid cartilage The two openings may be seen simultaneously If one only be seen after the other, and there be doubt in the matter, a rubber sound must be introduced into the diverticulum and a mandrin into the œsophagus

Treatment —Medical treatment is always indicated, for it is a good thing even when an operation must be performed, to prepare the patient, and to disinfect the diverticulum The treatment consists in keeping the diverticulum open and preventing stenosis of the œsophagus The pocket must be emptied when the food enters it and its evacuation facilitated Recommend thick soups, tapioca purées, and fatty food, which pass easily some patients can only swallow liquids

Forbid food which leaves a residue, such as stone fruit, salad, etc Avoid irritants (alcohol, condiments wine) Advise slow mastication and free salivation

Many patients succeed in washing out the diverticulum and removing all food by drinking immediately after food and by regurgitating the liquid swallowed

After food the existing remains ought to be removed from the diverticulum by the patient who should clean out the pocket by a self retaining catheter

A permanent or spasmodic stenosis of the œsophagus ought to be dilated If the patient be thin, feed him by the catheter

Surgical treatment is always *indicated it is relatively mild* The operations proposed are the following

(a) *Bevan s operation*, which consists in invaginating the diverti

culum by a series of purse-string sutures, the cavity is in this way obliterated

(*b*) *Extirpation a Simpler Method* —Performed *in one stage* it is serious, for there is a risk of cellulitis of the neck and of the mediastinum Operation in two stages is mild This is the operation we perform the first stage consists in exteriorisation of the diverticulum, it prepares the way *for cellular* and defensive reaction in the neck before opening the œsophageal cavity

The series of figures we have reproduced here show how we have proceeded

1. *Incision* over the *anterior* border of the sterno-mastoid, sometimes to the left, sometimes to the right The side where the pocket tends to protrude should be chosen Radioscopy informs us on this point In our patient we made an incision at the lower insertion of the sterno-mastoid, because the diverticulum was large, and we thought this *procedure necessary to exteriorise it easily*

The anterior border of the sterno-mastoid is exposed and pulled outside, and the subhyoid muscle cut (not absolutely necessary) The middle tendon of the omo-hyoid is divided

2 *Examination for the Diverticulum* —A grooved director and dissecting forceps separate the vascular tufts and the trachea and œsophagus Farabœuf's retractor, placed on the vessels, pulls them back to the outside The operator looks for the diverticulum below the cricoid cartilage it is situated exactly in the middle of the space thus excavated, resting on the vertebral column It always protrudes from one or other side of the œsophagus, often from both. It is recognisable by its whitish colour It could be taken for a hernial sac or for the thickened pre-vertebral aponeurosis *Dissecting forceps catch* hold of the whitish coat at the bottom of the excavated space between the vascular tufts and the trachea and œsophagus against the vertebral column It is easily drawn upon cleavage is made quite easily no hesitation *is possible on* the surgeon s part, *for there* is nothing else to be considered

3 *Exteriorisation of the Diverticulum* —The grooved director easily retracts the lax cellular tissue which surrounds the pocket more readily than in a hernial sac but some difficulties can be experienced *at the neck*. Here the connective tissue becomes fibrous and resistant the director works with the forceps the wall of the diverticulum appears *crossed* by tracts of cellular tissue and muscular fibres (it is between *these muscular fibres* the diverticulum protrudes) *If the pedicle* be large as in our case it is very difficult

to know to what extent traction can be exercised on the diverticulum and on the œsophagus Moreover, traction on the diverticulum kinks the œsophagus and exaggerates the stricture, feeding the patient afterwards must be considered

It is a good thing to place a sound in the œsophagus so as to verify constantly its direction and calibre, and to know where the entrance to the diverticulum is to be found The axis of the œsophagus must not be kinked, it must remain vertical, as normally

4 *Resection of the Diverticulum* —We have not resected in one stage Grégoire advises forceps to be placed on the diverticulum at its implantation, and another pair a little below on the side of the diverticulum The first closes the pharyngo-œsophageal cavity the second prevents discharge of the saliva contained in the sac The pedicle is divided between the two forceps with the thermo-cautery

5 *Suture of the Opening* —Grégoire advises a first row of continuous catgut sutures, avoiding the mucous surface When the continuous suture is finished, the forceps are removed The pharyngo-œsophageal cavity is closed A second row of interrupted stitches is placed above the first, including the superficial parts of the tube

This stage has appeared to me personally to be very difficult, an œsophageal wound is not closed as an intestinal or gastric one The walls are friable, the tube is deep, the risks of contamination are numerous I have noted it many times during external œsophagostomy

For this reason I prefer the operation in two stages which is perhaps less brilliant, but there is no risk to the patient

I perform a preliminary gastrostomy so as to feed the patient from the first day It is a good precaution Gastrostomy causes no risk Directly the cervical wound is healed, the stomach tube is withdrawn and the opening heals spontaneously



FIG 29 — DIVERTICULUM OF THE ŒSOPHAGUS.

Radiographical examination. The diverticulum, filled with bismuth, is opaque to the X rays.



FIG 30 —DIVERTICULUM OF THE ŒSOPHAGUS.

Incision in L to reach, if necessary the posterior mediastinum. The operator allows plenty of space to give the best access to the diverticulum and not to risk bursting it during the manipulations. Division of the sterno-mastoid matters little because it will be repaired after the operation.

Ligne d'incision = Line of incision

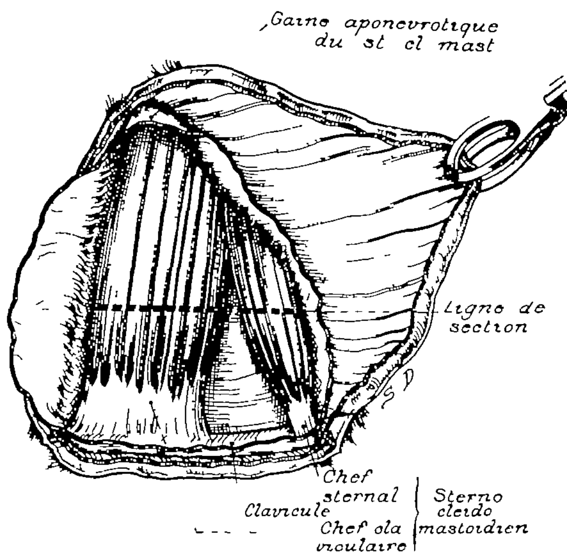


FIG 31 —DIVERTICULUM OF THE ŒSOPHAGUS.

Appearance of the incision once the sheath of the sterno-mastoid is opened; the division is made across the fleshy part, sufficiently far from the clavicle to facilitate the suture and repair of the muscle.

Gaine aponévrotique du st -cl mast —Aponeurotic sheath of the sterno-cleido-mastoid *Ligne de section* —Line of the incision. *Chef sternal* —Sternal head *Clavicule* —Clavicle *Chef claviculaire* —Clavicular head. *Sterno-cléido-mastoïdien* —Sterno-cleido-mastoid.

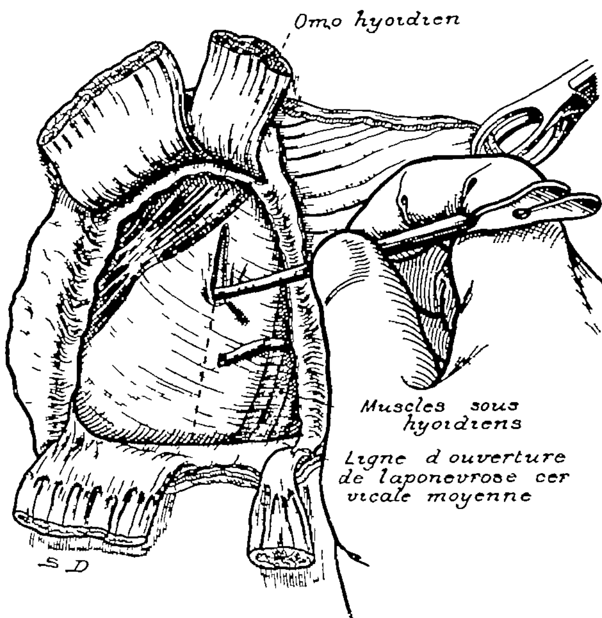


FIG 32.—DIVERTICULUM OF THE ŒSOPHAGUS.

Opening the middle cervical aponeurosis, once the extremity of the sterno-mastoid has been retracted.

Omo-hyoïdien = Omo-hyoid *Muscles sous-hyoïdiens* = Subhyoid muscles *Ligne d'ouverture de l'aponévrose cervicale moyenne* = Line of opening of the middle cervical aponeurosis

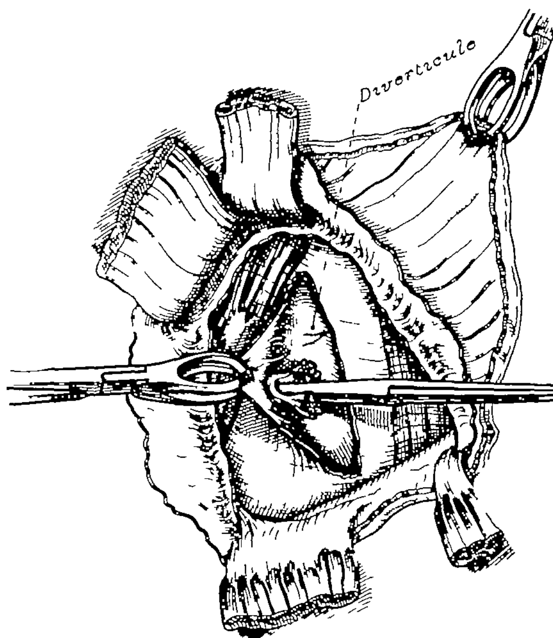


Fig 33.—Diverticulum of the Œsophagus.

Exploration for the diverticulum, which appears greyish-white in colour like a thick hernial sac. It is only identified because a thick membrane is found, which never exists at that point.

Diverticulo—Diverticulum

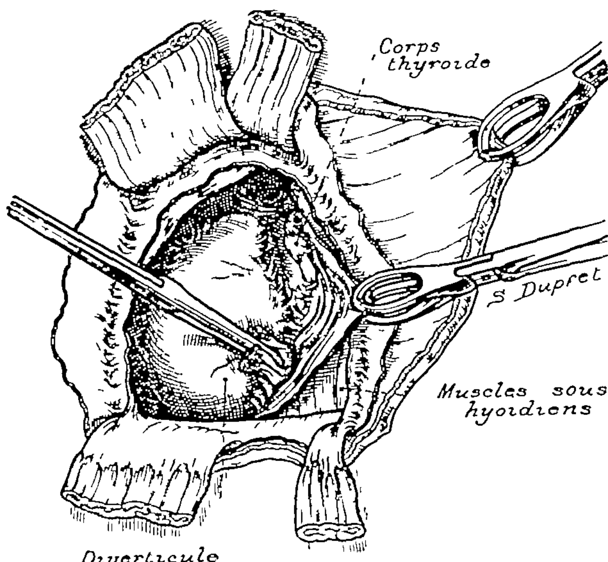


FIG 34 — DIVERTICULUM OF THE ŒSOPHAGUS.

The thyroid is retracted inwards. The diverticulum is freed with a tampon mounted on forceps the diverticulum is quite hidden in the thorax. It is gradually brought up and by degrees exposed.

Corps thyroïde = Thyroid body *Muscles sous-hyoïdiens* = Subhyoid muscles *Diverticule* = Diverticulum



Fig 35.—Diverticulum of the Œsoph

The diverticulum is separated from the thyroid
brought up from within the thorax by ring

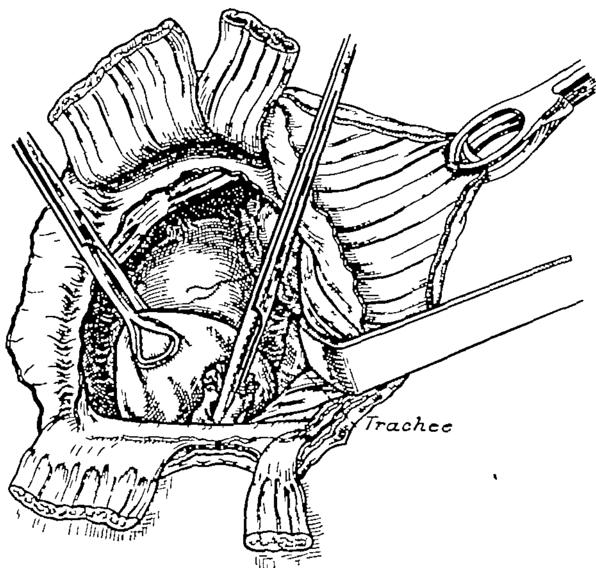


FIG 36 —DIVERTICULUM OF THE ŒSOPHAGUS.

The lower extremity of the diverticulum is exteriorised. Two instruments are used, the one ring forceps, which pull on its extremity and the other forceps holding a tampon.

Trachée = Trachea

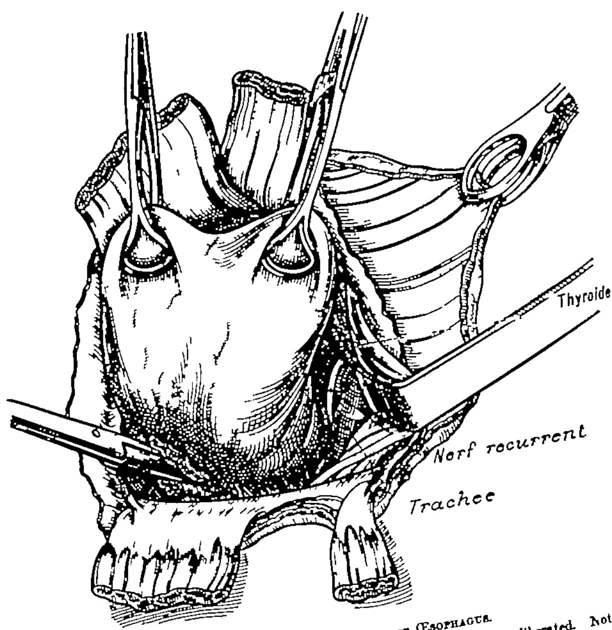


FIG 37 —DIVERTICULUM OF THE ŒSOPHAGUS.

The insertion of the diverticulum in the œsophagus continues to be liberated. Note the position of the thyroid, of the trachea, and of the recurrent nerve.

Thyroide = Thyroid. *Nerf récurrent* = Recurrent nerve. *Trachée* = Trachea

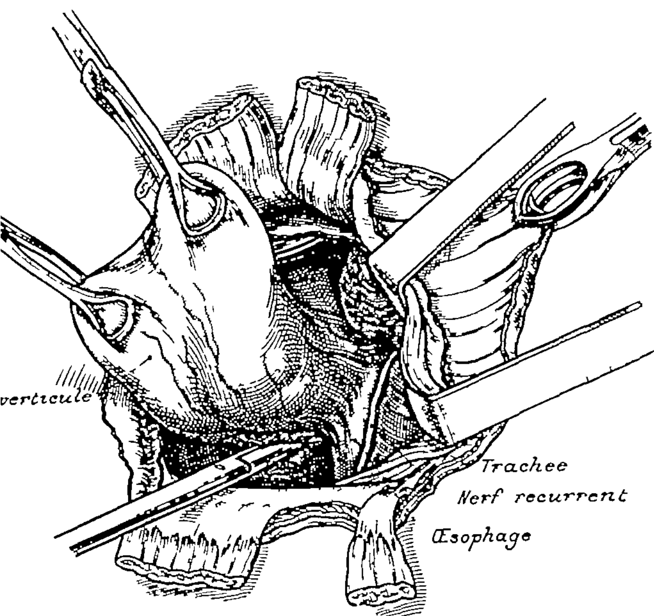


FIG 38.—DIVERTICULUM OF THE ŒSOPHAGUS.

Note the broad implantation of the diverticulum into the œsophagus it is difficult to separate the one from the other The operator tends to exteriorise too much of the œsophagus, and this produces a kink hence the necessity of placing a tube in the œsophagus, to note the tissue which ought to remain to form its canal.

Diverticule = Diverticulum *Trachée* = Trachea. *Nerf récurrent* = Recurrent nerve *Œsophage* = Œsophagus

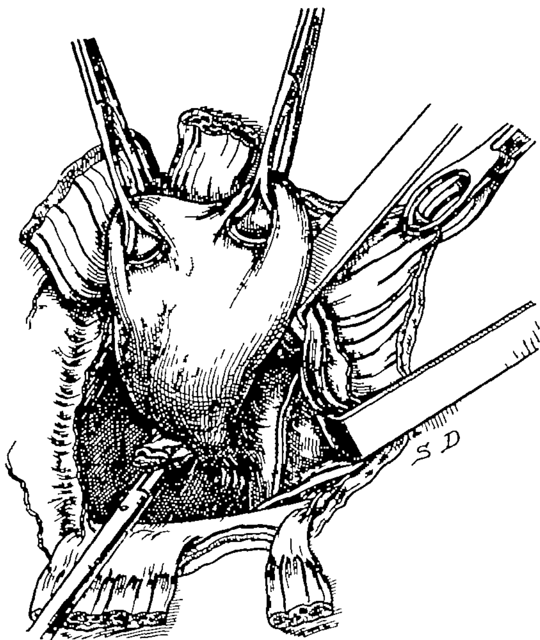


FIG 39.—DIVERTICULUM OF THE ŒSOPHAGUS.
Freeing the pedicle of the diverticulum posteriorly

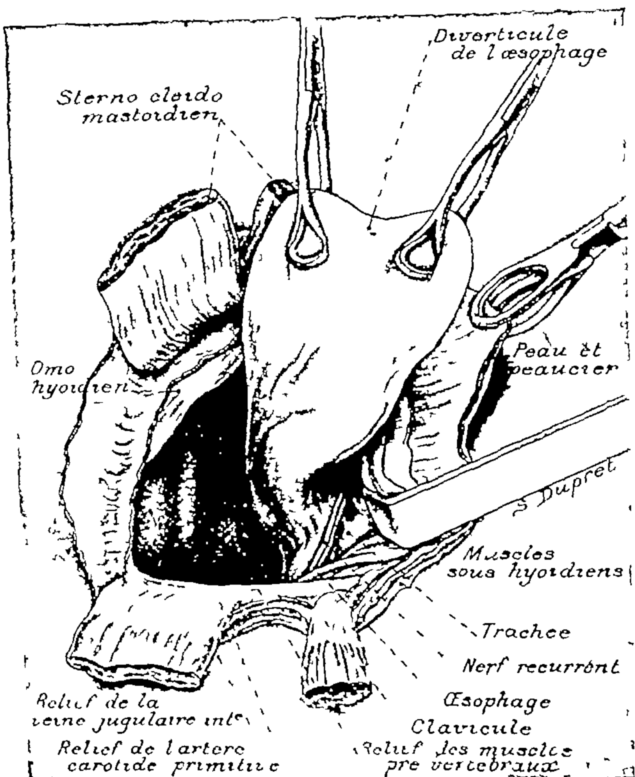


Fig 40.—Diverticulum of the Œsophagus.

Appearance of the region of the neck when the diverticulum has been freed This diverticulum which is entirely within the thorax, is completely exteriorised.

Sterno-cléido-mastoïdien = Sterno-cleido-mastoid *Diverticule de l'œsophage* = Diverticulum of the œsophagus *Omo-hyoïdien* = Omo-hyoid *Peau et peaucier* = Skin and platysma *Muscles sous-hyoïdiens* = Subhyoid muscles *Trachée* = Trachea *Nerf récurrent* = Recurrent nerve *Œsophage* = Œsophagus *Relief de la veine jugulaire interne* = Outline of the internal jugular vein *Clavicule* = Clavicle *Relief de l'artère carotide primitive* = Outline of the common carotid artery *Relief des muscles prévertébraux* = Outline of the prevertebral muscles

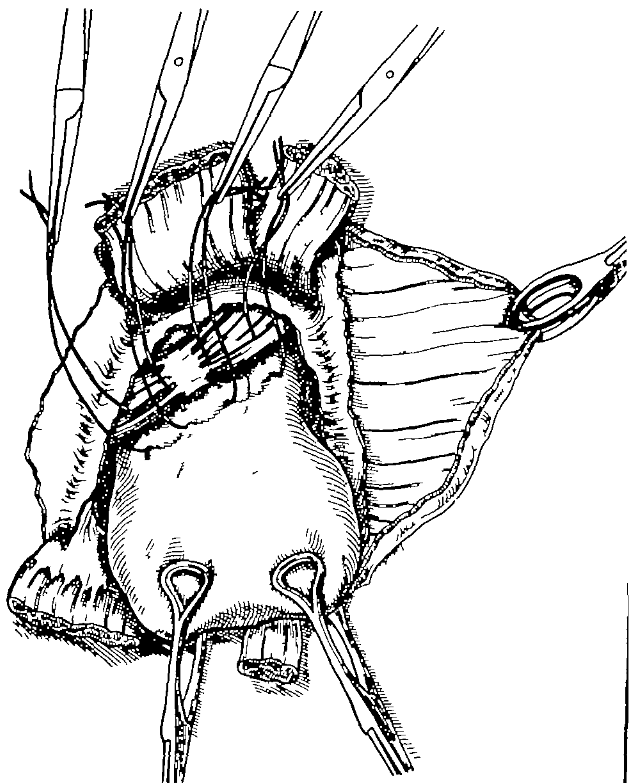


Fig 41 —Diverticulum of the Œsophagus

Fixation of the diverticulum to the omo-hyoid to avoid its retraction. Here the presence of an intra œsophageal sound is useful, for there is a risk of suturing the œsophagus to the muscle.

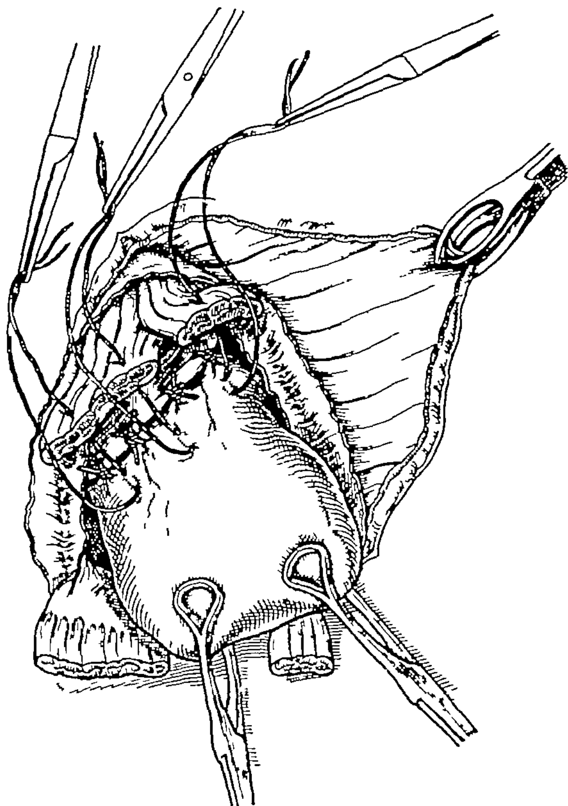


FIG 42.—DIVERTICULUM OF THE ŒSOPHAGUS.

The wall of the diverticulum is sutured to the extremities of the sterno-mastoid, and after secondary resection of the diverticulum the two extremities of the sterno-mastoid should then be sutured.

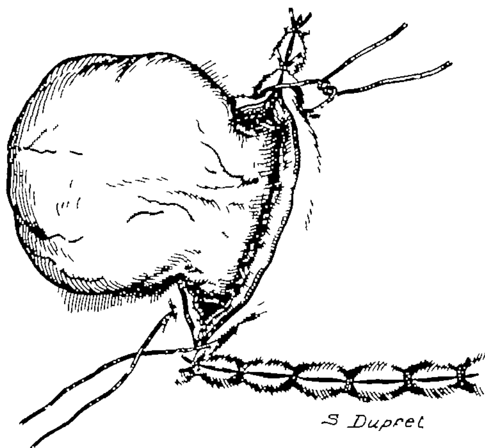


FIG 43.—DIVERTICULUM OF THE ŒSOPHAGUS.
Appearance of the diverticulum which protrudes outside the skin.

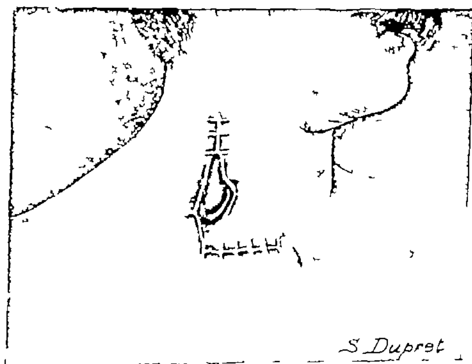


FIG 44.—DIVERTICULUM OF THE ŒSOPHAGUS.
Appearance of the contracted diverticulum, covered by embryonal tissue one month *after operation*

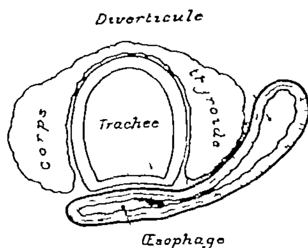


FIG 45.—DIVERTICULUM OF THE ŒSOPHAGUS.

Diagram showing the appearance of the diverticulum on transverse section of the neck.

Diverticule=Diverticulum *Corps thyroide*=Body of the thyroid *Trachée*=Trachea. *Œsophage*=Œsophagus

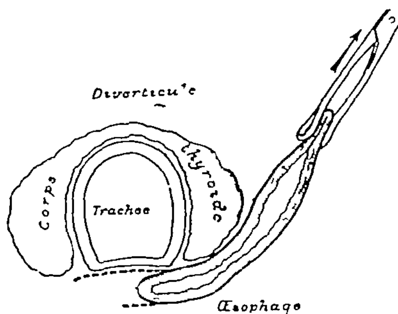


FIG. 46.—DIVERTICULUM OF THE ŒSOPHAGUS.

Diagram showing how the œsophagus is pulled upon by the ring forceps which draw on the diverticulum. It may happen to the operator whilst resecting the diverticulum, either to injure the œsophagus, which is out of place or to exteriorise the former too near the alimentary canal, which would produce secondary stenosis.

Diverticule=Diverticulum. *Corps thyroide*=Body of the thyroid. *Trachée*=Trachea. *Œsophage*=Œsophagus

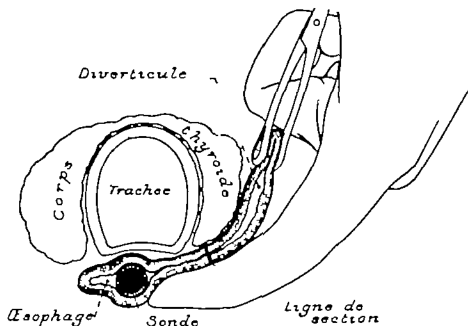
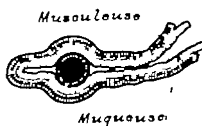


FIG 47.—DIVERTICULUM OF THE ŒSOPHAGUS.

How to avoid dragging the œsophagus too far or dividing the wall of the alimentary canal itself. The sound, placed in position before operation, acts as a landmark The operator notes, in this way if it remain in its place, or if on the contrary it be displaced. The black line indicates the line of incision.

Diverticule—Diverticulum *Corps thyroide*—Body of the thyroid. *Trachée*—Trachea. *Œsophage*—Œsophagus *Sonde*—Sound. *Ligne de section*—Line of incision



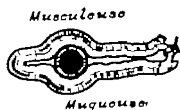




FIG 48.—DIVERTICULUM OF THE ŒSOPHAGUS.

Drawings of the operation, showing suture of the œsophagus at the union with the diverticulum, whether the operation is performed in one or two stages.

Musculeuse—Muscular *Muqueuse*—Mucosa. *Œsophage*—Œsophagus *Sonde*—Sound

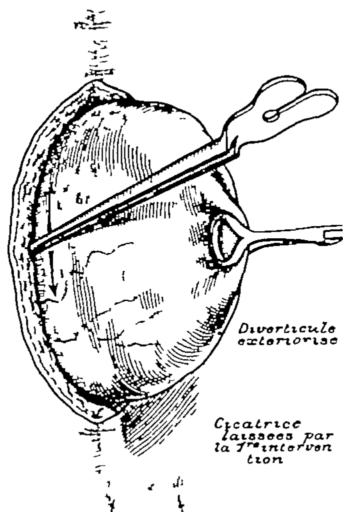


FIG 49.—DIVERTICULUM OF THE ŒSOPHAGUS.

SECOND STAGE.—The pocket, being first fixed externally is afterwards freed by the grooved director in order to be removed.

Diverticule extériorisé—Exteriorised diverticulum. *Cicatrice laissées par la 1re intervention*—Cicatrix left after the first operation.

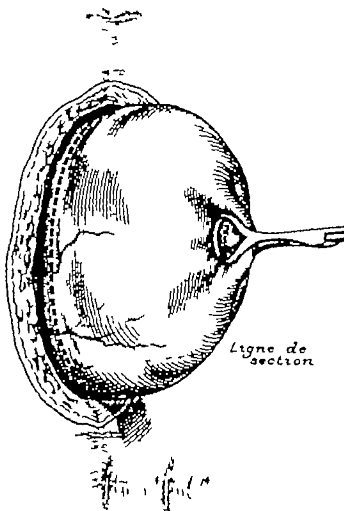


Fig 60.—Diverticulum of the Œsophagus.

Second Stage.—The dotted line indicates the place where the grooved dire[ctor] knife has separated the exteriorised and adherent pocket from the ne[ighbouring] tissue

Ligne de section = Line of incision

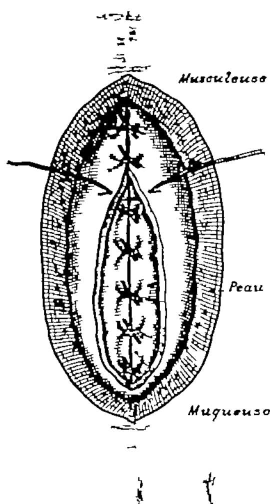


FIG 51.—DIVERTICULUM OF THE ŒSOPHAGUS.

SECOND STAGE.—Directly the diverticulum is exteriorised and divided the wound is closed at two levels.

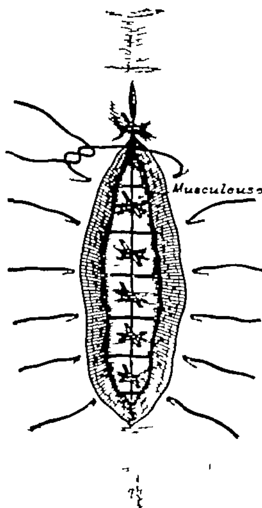


FIG 52.—DIVERTICULUM OF THE ŒSOPHAGUS.

The operation is finished.

Musculeuse = Muscle   *Peau* = Skin   *Muqueuse* = Mucosa

IV

BILIARY SURGERY

Restoration of the Ductus Choledochus—Treatment of Biliary Fistulæ.

It often happens that the hepatic duct and the ductus choledochus are injured during an operation on the biliary passages The wound may be repaired immediately, and the normal passage of the bile is effected, or the restoration may be omitted or be defective, a biliary fistula results

These affections are relatively quite frequent They can be due to the surgeon having excised a stricture or a neoplasm. They may be the result of a badly made incision for stone in the choledochus The opening has been transverse instead of vertical. In some obese patients when the liver cannot be brought outside, the operation to remove the stone has been performed deep down, the surgeon sees the organs badly, and may, unfortunately, make an oblique or transverse incision of the ductus choledochus, thinking it is vertical This is certainly very rare in the hands of skilled surgeons But Kehr, whose experience we all know, has met with fifteen ruptures of the ductus choledochus out of 1,000 operations The accident occurs in the following conditions

The surgeon believes he has caught the cystic duct at the junction of the ducts, and he has instead seized the hepatic duct or the ductus choledochus Too often he places the ligature, not on the cystic duct, but on the common bile-duct itself * In these conditions the ductus choledochus is partly excised or dies a permanent fistula results

It is a fault which can usually be avoided, especially if the method of Mayo-Gosset for resection of the gall bladder be performed passing from the common bile-duct to the fundus, but this method of cholecystectomy from below upwards is not at all easy when tight adhesions exist In a simple case it is easy to lay bare the cystic duct and to recognise the cystic artery before seizing it, but when

* Practical Surgery Illustrated, by Victor Pauchet Vol. IV., p 61 "Operations on the Biliary Passages

the biliary passages are adherent and altered by the inflammatory process, it is difficult to identify each duct and organ Nay more, it is possible the cystic and hepatic ducts may be united side by side in intimate contact with each other The cystic duct itself may form a spiral on the anterior surface of the hepatic duct before opening into it The two organs are united by inflammatory adhesions Lastly, there are anatomical anomalies which make this error still more easy

Briefly, it may happen during the operation for choledochotomy that the operator perceives he has divided the ductus choledochus completely or partly across, he ought to repair it Usually a suture is sufficient, especially if the ductus choledochus be broad Suture at one level with slowly absorbable catgut 00, as the ureter, often succeeds A temporary fistula frequently persists, which afterwards closes of itself Often the continuity of the incompletely cut duct is re-established spontaneously without suture

Ordinarily the fistula appears at the end of some days The bile soils the dressing The fæcal matters remain discoloured All the bile passes by the operative wound The surgeon waits two or three months, sometimes more, after this he ought to come to a decision What is to be done ?

(*a*) *A Cholecysto-Gastrostomy ?*—Yes, if the gall bladder has been preserved. The operator then liberates it partially resects it if it be too large, and then implants it into the stomach

(*b*) *Fistula into the Intestine* —I will explain it by a personal example A patient on whom I operated fifteen years previously had a fistula, I reoperated and dissected the track I thus separated to the very bottom a tube ' of cicatricial tissue, the fistula was its axis. I in this way reached the neighbourhood of the ductus choledochus, which I did not see This artificial canal, cut in the inflammatory adhesions of the omentum its track freed and organised and dissected with care, appeared to me to be bleeding and active for 3 centimetres I perforated the duodenum and implanted the fibrous canal into the intestine I covered the space with omentum The fistula passed into the intestine the patient, operated upon fifteen years since has never had a new attack of angio-cholitis This success is encouraging but I do not recommend it in a very feeble patient on whom a minimal operation is desirable It is better to follow the dissection of the fistula as far as the ductus choledochus and make a temporary prothesis by a rubber tube

(c) *Restoration of the Common Bile-Duct by a Drainage Tube* — I have had recourse to this procedure on two occasions, each time the fistula was persistent, lasting three months in one case and five in the other The general state of the patient was very good, he wished to get rid of his infirmity This is what I did In the first case I separated with trouble the adherent organs in the direction of the ductus choledochus, and ultimately found it Its diameter was that of a pencil The search for it required three-quarters of an hour The abundant hæmorrhage prevented a clear view, by means of the application of warm serum I finally discovered the duct I introduced into its cavity a piece of Nélaton s catheter, No 16 I fixed it with a catgut stitch, then I perforated the duodenum with Kocher s forceps I introduced a drainage-tube, I buried it under four stitches into the serous surfaces, as in gastrectomy I repaired level by level the wound I had laboriously excavated The patient is perfectly cured, the cure has lasted for seven years He never noticed when the rubber tube was evacuated in the stools

The second case is different The persistence of the fistula was due to rupture of the common bile-duct, which contained large calculi and at the same time to the persistence of a stone wedged in the ampulla of Vater I performed the following operation I dissected the fistulous track up to the trunk of the duct, explored the duodenum by palpation and recognised a calculus the size of a nut which had been missed at the first operation and which might have increased in volume I opened the duodenum, incised the ampulla of Vater, and enucleated the stone I introduced a bougee with Béniqué s curve into the dilated ampulla of Vater By the bougee, its point towards the liver I discovered a cul-de-sac corresponding to the termination of the obliterated ductus choledochus The cul-de-sac was opened by the bougie, which was replaced by Kocher s forceps, a Nélaton s catheter was introduced into the other end of the fistulous common bile-duct and then drawn from without inwards by Kocher s forceps into the duodenum, which was then closed The subhepatic wound and the omentum were repaired The patient has remained quite cured for nine years, the bile slowly discharged by the wound from the fourth to the fifth day after the operation The general condition of the patient has never altered He leads only a slightly fatiguing life breeding trout

Sullivan has performed prothesis with rubber in dogs, and has noticed true regeneration of the bile-duct The tube became surrounded by an epithelial covering by vegetations and growth

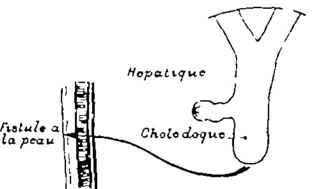


FIG 53.—BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

Hépatique—Hepatic duct *Cholédoque*—Ductus choledochus *Fistule à la peau*—Fistula to the skin *Duodénum*—Duodenum

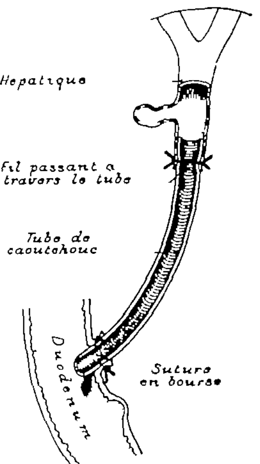
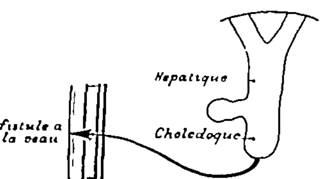


FIG 56.—BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

The operator has placed one end of a drainage-tube into the duodenum and the other into the ductus choledochus. The duodenal end ought to be buried under a continuous suture to the serous surfaces, as in gastrostomy so as to ensure its continence

Hépatique—Hepatic duct *Fil passant à travers le tube*—Thread passing across the tube *Tube de caoutchouc*—Rubber tube *Suture en bourse*—Purse-string suture *Duodénum*—Duodenum



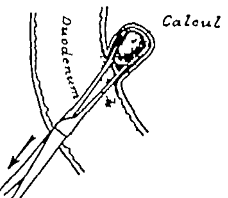
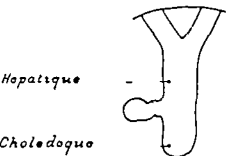


FIG 57.—BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

Here a calculus persists in the ampulla of Vater The operator makes an exploratory duodenostomy and removes a calculus, which will leave behind it a dilated ampulla of Vater The aim of the operator will consist in anastomosing the ampulla with the fistulous ductus choledochus.

Hépatique = Hepatic duct *Cholédoque* = Ductus choledochus *Fistule à la peau* = Fistula to the skin *Calcul* = Calculus. *Duodénum* = Duodenum



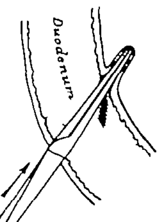
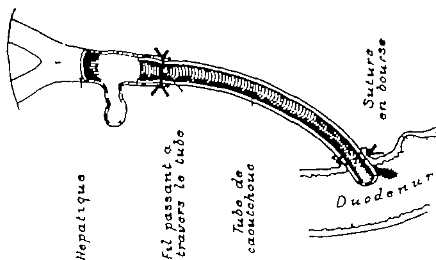
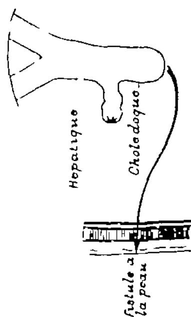


FIG 58.—BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

How the ampulla of Vater is made to communicate with the exterior Forceps introduced into the duodenum make the ampulla of Vater protrude and tear it open; a tube will be brought through this opening.

Hépatique = Hepatic duct *Cholédoque* = Ductus choledochus *Duodénum* = Duodenum


Hepatique
Fil passant a travers le tube
Tube de caoutchouc
Suture en bourse
Duodenu


Hepatique
Choledoque
fistule à la peau
Duoden

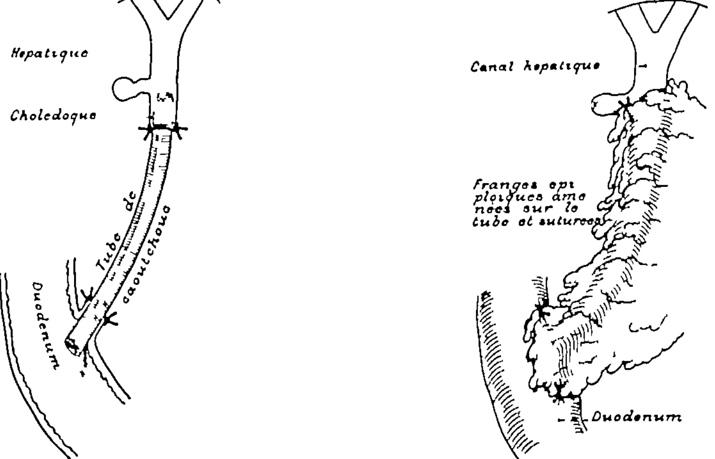


FIG 61.—BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

The tube is fixed by its two ends by two catgut stitches.

Hépatique = Hepatic duct *Cholédoque* = Ductus choledochus *Tube de caoutchouc* = Rubber tube *Duodénum* = Duodenum

FIG 62.—BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

The duodenum and the ductus choledochus are covered by a layer of omentum.

Canal hépatique = Hepatic duct *Franges épiploïques amenées sur le tube et suturées* = Appendices epiploicæ brought over the tube and sutured *Duodénum* = Duodenum

These figures as the preceding are only diagrammatic The rubber tube has been made very large for the sake of comprehension

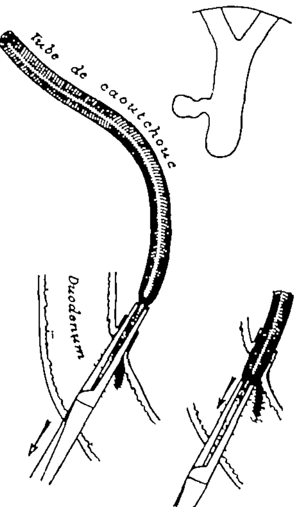


FIG. 59 —BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

The rubber tube is brought into the duodenum A stitch fixes the drainage-tube to the fragment of the ampulla.

Tube de caoutchouc — Rubber tube *Duodénum* — Duodenum

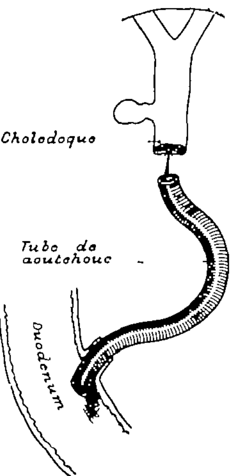


FIG 60 —BILIARY FISTULA FROM OBLITERATION OF THE DUCTUS CHOLEDOCHUS.

The upper extremity of the tube is introduced into the ductus choledochus.

Cholédoque — Ductus choledochus *Tube de caoutchouc* — Rubber tube *Duodénum* — Duodenum

Fig 61 —Biliary Fistula from Obliteration of the Ductus Choledochus.

The tube is fixed by its two ends by two catgut stitches.

Hépatique = Hepatic duct   *Cholédoque* = Ductus choledochus   *Tube de caoutchouc* = Rubber tube   *Duodénum* = Duodenum

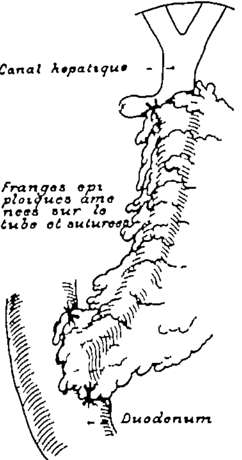


Fig 62 —Biliary Fistula from Obliteration of the Ductus Choledochus.

The duodenum and the ductus cholodochus are covered by a layer of omentum

Canal hépatique = Hepatic duct   *Franges épiploïques amenées sur le tube et suturées* = Appendices epiploicæ brought over the tube and sutured   *Duodénum* = Duodenum

These figures as the preceding are only diagrammatic. The rubber tube has been made very large for the sake of comprehension

V

GASTRO-DUODENAL SURGERY*

THE numerous gastro-duodenal operations present a great variety Each one finds its precise indications A method of choice is applicable to every case Here are some facts our latest experience has taught us

(*A*) **Anæsthesia** —We have recourse to three methods

(*a*) Regional anæsthesia infiltration of the abdominal wall combined with injection of the splanchnic nerves by the latero-posterior route

(*b*) Dorso-lumbar spinal anæsthesia, with 10 centigrammes of novocaine, or 15 centigrammes of syncaine, 50 centigrammes of caffeine are injected under the skin two hours before, 1 c cm. of scopolamine and morphine is injected one hour before

(*c*) Simple local anæsthesia of the wall, combined with nitrogen monoxide

We most often use the first method

(*B*) **Incisions** — Eight times out of ten we commence by a median incision Very often we branch off a perpendicular one right or left according as the difficulties of the operation present themselves at the duodenal or at the cardiac end.

The transverse incision is very good as regards firmness of the wound and for æsthetic purposes, unfortunately it does not always give sufficient space to reach a gastric ulcer situated high up For this purpose costal resection (umbrella incision) (*vide* pp 78, 87) or the pointed incision of Leclerc must be employed, the latter, which we have not figured, consists of two incisions each parallel to the costal border It allows of turning down a triangular flap to the umbilicus The upper part of the abdomen is widely exposed One precaution is advisable at the time of closure a wire stitch in U must be introduced penetrating the whole wall including the skin and uniting the superior angles of the wound Two para

* We invite the reader to look at the figures which follow this article before reading the text

costal incisions are the result, which are sutured separately at two levels by slowly absorbable catgut and clips

To close a median incision we employ either a wire suture at one level or slowly absorbable catgut and clips

In cases where the incision is square we suture (*a*) the transverse portion with slowly absorbable catgut and clips, (*b*) the vertical portion at one level, with silkworm gut

(*C*) **Crushing** —This method, invented by Souligoux (1896), does not produce perfect hæmostasis or prolonged apposition of the serous borders, but it allows linear incisions, reduces hæmorrhagic oozing, and facilitates the manipulations and asepsis It is not indispensable, but it is very useful

(*D*) **Non-Perforated Duodenal Ulcer** —Half of the cases operated upon in which a diagnosis has been made clinically of a duodenal ulcer are erroneous What do we find? Sometimes a gastric ulcer close to the pylorus sometimes a stone in the gall bladder sometimes chronic intestinal stasis, sometimes no lesion is perceptible (this is the exception) In this last case we do nothing Never perform gastro-enterostomy on a patient in whom no lesion is found, otherwise he is worse than before, and his only chance of improvement will be later to meet with a surgeon who is willing to remove the gastro-enterostomy for which there had been no indication

If the patient be in pain, I perform section of the nerves of the stomach, following Latarjet s technique, which has given me good results

The radiological history provided by the patient is generally insufficient, every patient suffering from gastric symptoms, and who has not pyloric or duodenal stenosis ought to be subjected to a complete examination of the intestinal digestion It is not sufficient for radiography to indicate the appearance of the digestive tube for twenty four or thirty six hours, it is necessary for the radioscopical tests to be continued as long as there is bismuth in the intestine Moreover a large number of patients suspected of duodenal ulcer have an intestinal lesion or a kink It is a good thing to know this before operation so as not to make a useless intervention and to be able to change the plan of the operation as soon as it is demonstrated a duodenal ulcer is non-existent It is also necessary for the surgeon to know the chemistry of the stomach If the patient, moreover, suffer from hypochlorhydria the operator

symptoms, secondary resection of the pyloric part of the duodenum should be performed

These two stages executed separately cause no risk to the patient, and the result is generally very good

I think I can say of 100 cases of duodenal ulcer treated by simple gastro-enterostomy 70 were completely and permanently cured, those who were not cured were sufferers from marked hyper chlorhydria, or the operator had not recognised a stone in the gall bladder, a gastric ulcer, or chronic intestinal stasis, if the patient operated upon be satisfied at first with the way the gastro-intestinal tract is functionating, but afterwards begin to suffer, jejunal ulcer should be feared a condition which must be operated upon quickly

Exclusion of the pylorus is a logical operation, but does not give the expected results We have noticed jejunal ulcers were more frequent after this operation We have therefore abandoned it Nevertheless, it occurs without attempting it when the duodenal ulcer is buried If moreover, the operator perform simple gastro-jejunostomy, and if he have noted the base of the ulcer be separated from the peritoneal cavity by only a slight amount of the serous layer it is a good thing to bury it to prevent perforation Very often burying produces partial or complete exclusion

(*E*) **Non-Perforated Gastric Ulcer** —We have performed some cuneiform excisions The operation has appeared to us more difficult and less efficacious than partial resection We have abandoned it, although logically it is the more enticing

Thermo-cauterisation (Balfour) presents nearly all the advantages of excision, without the same difficulties or dangers. It is a mild operation which sometimes gives good results But these are generally inconstant We have many times performed gastrectomy secondarily on patients on whom excision or Balfour s operation has been carried out We reserve it for feeble patients (obese) with a small ulcer situated high up

Simple gastro-enterostomy, often a good operation for duodenal ulcer is not at all applicable to the majority of gastric ulcers. It does not prevent them from progressing and undergoing cancerous change But like Balfour s operation it can yet be of great service in fat patients or in cases where the operator finds the technique too arduous It is often inefficacious We prefer gastrectomy which, by means of certain points in technique, is a mild operation

In non perforated gastric ulcer should gastro-pylorectomy be performed—*i.e* the large operation of removal of the duodenum

of the pylorus, and of the small tuberosity of the stomach—or should annular resection, with end to-end suture of the stomach, be carried out? This will depend on the existence or on the absence of hyperchlorhydria, and on the condition of the lesions If the lesions be extensive, or there be marked hyperacidity it is better to remove a large quantity of the tissues, if the lesions be limited, and there be hypochlorhydria we should be sparing of the tissue of the stomach. Since 1910 we have performed gastro-pylorectomy Now we preserve as much as possible of the duodenum, and we finish by end to-end gastro-duodenal anastomosis (Péan), it is certainly the operation of choice, superior to gastro-jejunal anastomosis (Billroth)

When we perform gastro-enterostomy after gastro-pyloric resec tion we have generally had recourse to a modified Polya's method We decrease the length of the gastric opening and reduce it to 5 or 6 centimetres, and then we implant it into the jejunum, we choose a very long jejunal loop the two jejunal limbs are reunited by a button Sometimes we make a pre-colic, sometimes a trans mesocolic anastomosis, it matters not whether it is made in front of or behind the transverse colon. If the meso-colon be thin and diaphanous, we make a trans mesocolic anastomosis, when it is infiltrated, however little, with fat, we make it in front of the colon The result is practically the same

(*F*) **In Case of Gastric Ulcer of the Small Curvature Situated High Up,** we perform the following operation a median incision, with separation on the left side, or Leclerc s pointed incision, or, if the stomach be contracted costal resection and umbrella incision If the subject suffer from hyperchlorhydria we begin resection at the duodenum in order to remove the greater part of the stomach If there be hypo- or slight hyperchlorhydria we keep the whole of the end part of the stomach We then operate in the following way a complete division of the stomach perpendicular to its axis, immediately below the ulcer The division is made between two clamps The pyloric portion is covered up and pulled to the right After protecting the abdomen we remove the upper clamp and we dry the cavity of the stomach with the aspirator, gastro-enterostomy crushing forceps cannot be used We then excise the ulcer with scissors The line of section although continuous is moreover double the one crushed perpendicularly to the axis of the stomach results from the complete division of the organ and the other from excision of the small curvature The latter is sutured to itself the other is anastomosed to the pyloric portion of the

symptoms, secondary resection of the pyloric part of the duodenum should be performed

These two stages executed separately cause no risk to the patient, and the result is generally very good

I think I can say *of 100 cases of duodenal* ulcer treated by simple gastro-enterostomy 70 were completely and permanently cured, those who were not cured were sufferers from marked hyper chlorhydria or the operator had not recognised a stone in the gall bladder, a gastric ulcer, or chronic intestinal stasis, if the patient operated upon be satisfied at first with the way the gastro-intestinal tract is functionating, but afterwards begin to suffer, jejunal ulcer should be feared, a condition which must be operated upon quickly

Exclusion of the pylorus is a logical operation, but does not give the expected results. We have noticed jejunal ulcers were more frequent after this operation We have therefore *abandoned* it Nevertheless it occurs without attempting it when the duodenal ulcer is buried If, moreover, the operator perform simple gastro-*jejunostomy, and if he have noted the base of the ulcer be separated* from the peritoneal cavity by only a slight amount of the serous layer, it is a good thing to bury it to prevent perforation Very *often burying produces partial or complete exclusion.*

(*E*) **Non-Perforated Gastric Ulcer**—We have performed some cuneiform excisions The operation has appeared to us more difficult and less efficacious than partial resection We have abandoned it, although *logically* it is the more enticing

Thermo-cauterisation (Balfour) presents nearly all the advantages of excision, without the same difficulties or dangers *It is a mild operation, which sometimes gives good results* But these are generally inconstant We have many times performed gastrectomy secondarily on patients on whom excision or Balfour's operation *has been carried out* We reserve it for feeble patients (obese), with a small ulcer situated high up

Simple gastro-enterostomy, often a good operation for duodenal ulcer *is not at all applicable to the* majority of gastric ulcers It does not prevent them from progressing and undergoing cancerous change But like Balfour's operation it can yet be of great *service in fat patients or in cases where the* operator finds the technique too arduous It is often inefficacious We prefer gastrectomy which by means of certain points in technique, is a mild *operation*

In non perforated gastric ulcer should gastro-pylorectomy be performed—*i.e.* the large operation of removal of the duodenum,

general state of the patient, on the condition of the lesions, and on the existence or absence of peritonitis Patients operated upon in the first six hours are cured nearly as easily as when there is no perforation The disadvantage exists in the fact that they have not been prepared, disinfection of the mouth or of the throat, *complete evacuation of the intestine, etc*

On principle, every operation of urgency requires the simplest technique and the minimum amount of manipulations Ordinary suture is applicable in a great number of cases connected with the stomach or with the duodenum

Should the edges of the wound be excised? Yes, if the edges be friable and it be necessary for union to be made possible

Should a gastro-enterostomy be performed secondarily? (The question only concerns the duodenum, which, moreover, is perforated three times as often as the stomach) No, if the evacuation of food be possible, yes, if the duodenum be contracted by plication

Should resection of a gastric ulcer be performed at once? Yes if, as a result of extensive induration, suture be impossible, and if reunion be precarious This is the exception.

To sum up, every operation other than simple suture may be rendered necessary by the condition of the lesions, but, on principle, the simplest and most quick operation should be performed. Do not advance the argument it is better to cure the patient permanently I repeat, it is better to cure a patient twice than to kill him once If once peritonitis be averted but the gastric symptoms persist, and if the surgeon find the functions of the stomach be defective, he has time to perform secondarily a gastro-enterostomy (duodenal ulcer) or a secondary resection (gastric ulcer) The latter is then carried out with the minimal risk

On principle undertake a short, rapid, simple operation simply to save the patient s life

(*II*) **Secondary Jejunal Ulcer**—Secondary jejunal ulcer is frequent (5 per cent) after gastro-enterostomy for duodenal ulcer with hyperchlorhydria It generally appears the year following the operation The symptoms it occasions are more serious than the primary ulcer Operation is indispensable It should be performed as early as possible, so as to avoid a very dangerous complication—fistula between the jejunum and the colon The operations for the latter are moreover of extreme gravity, simple as they may be The patients in these conditions have little resistance to the operation even the simplest and best executed

gastric margin We therefore suture the opening which results from excision of the ulcer, without concerning ourselves with the perpendicular gastric margin. We make this suture at two levels by means of Connel s and Cushing s stitches (slowly absorbable catgut) The result is a gastric tube open at the side of the pylorus The continuity of the digestive tract must then be re-established in one of two ways if we have resected the greater part of the stomach up to the duodenum, we bring the jejunum before or behind the colon and implant the stomach in the jejunum, if we have preserved a large part of the pyloric portion of the stomach, we implant the *gastric tube* which is only the continuation of the œsophagus, into the pyloric pocket we have preserved We contract the edge of the latter until it is adapted to the end of the gastric tube This operation is *difficult and long, it lasts an hour or an hour and a quarter* On three occasions we have performed it in two stages, but the difficulties of the operation which resulted from a previous gastro-enterostomy did not simplify our task We believe, then, on principle, it should be carried out in one stage

(*G*) **Perforated Gastric or Duodenal Ulcer** —Perforation of the duodenum is three times more frequent than that of the stomach, the majority of surgeons denominate it "pyloric' or ' juxta pyloric, because they think it unnecessary to look for its site in the duodenum The research is sometimes difficult

Anæsthesia —It should be local for the wall, and combined with nitrogen monoxide it is better to avoid the manipulations necessary for spinal anæsthesia or the injection of the splanchnics Spinal anæsthesia would be the procedure *of choice, because of the* muscular relaxation it procures but it lowers, sometimes, the arterial tension to such a degree that death can result If, then, the patient s arterial tension be low, spinal anæsthesia is not to be recommended We have, however employed it with success, the operation is then very easy

Incision —Pointed incision of Leclerc, or better a square incision, allowing a large access to the stomach and to the duodenum, according to the condition of the lesions met with It is often necessary to cut across the recti muscles so as to suppress their defensive contraction which often *persists notwithstanding* the local anæsthesia combined with the narcosis

How is the perforation to be treated ? By simple suture, by gastro-enterostomy or by resection ?

What procedure should be adopted ? That depends on the

In cases of inoperable cancer we have on many occasions applied needles of radium, with surprising immediate results—disappearance of pain and of hæmorrhage, and apparent return of health The results are transitory

When we perform a simple gastro-enterostomy for pyloric cancer we always make it anteriorly pre-colic with a long loop, and we complete it by a jejuno-jejunostomy This is the method which has appeared to us the mildest

Should cancers of the stomach producing stenosis be operated upon in one or in two stages?

Generally when we decide to operate on a cancer in two stages we end by removing it in one, because the lesion which we thought was purely pyloric ascended in the direction of the cardia, which causes difficulty in the performance of gastro-enterostomy and renders the second stage impossible We have often performed gastrectomy in these conditions, with perfect results

But if the tumour be limited to the pylorus, if it be adherent and a long operation appear necessary, if the patient be cachectic, dehydrated and anæmic, we perform the operation in two stages first gastro-enterostomy, then gastrectomy, with transfusion of blood between the two operations The gastro-enterostomy should be made as far as possible from the pylorus so that a large amount of tissue would remain at the time of the second stage This allows of poor drainage it should be completed by a jejuno-jejunostomy

Secondary gastrectomy ought to be performed quite early—ten to fifteen days on the average The second stage is generally very mild Survival after operation in two stages is less than after operation in one stage

(*J*) **Gastro-Enterostomy and Jejuno-Jejunostomy**—We have spoken many times of this combination. We will state briefly the indications, which are many

(*a*) When the anastomosis is made with a long jejunal loop

(*b*) When the operator fears the drainage of the stomach will not be good whatever the reasons

(*c*) In all cases of anterior gastro-enterostomy, an operation less exacting than the posterior trans-mesocolic operation

We should employ either the method of Roux, operation in Y, or the much easier and above all shorter, operation, side-side jejuno-jejunostomy with the button *

The button generally comes away on the eighth or tenth day

* See Vol I Practical Surgery Illustrated, p 266

What operations are applicable to jejunal ulcer ?

(a) *Suppression of the Gastro-Enterostomy*.—If the duodenal ulcer be cured, if the cicatrised ulcer has not caused stenosis, a new operation is unnecessary

(b) *Gastro-Duodenostomy*.—Suppress the ulcerated anastomotic opening and perform Finney's operation If the duodenal ulcer be still existent, excise the ulcer and make a vertical gastro-duodenal suture, this anastomosis does not render the patient liable to a jejunal ulcer

(c) *Gastrectomy*.—If Finney's operation be not possible, and if the patient still suffer from marked hyperchlorhydria, a large resection of the stomach and of the jejunum is necessary *

Every surgeon ought to fear jejunal ulcer, for this reason he should recommend that in every case of gastro-enterostomy for duodenal ulcer the patient should diet himself for six months afterwards (Léon Meunier) no meat or albumen, oil during meals, etc

The surgeon should, for preference, perform a gastro-duodenostomy, and reserve gastro-jejunostomy for cases in which Finney's operation is too difficult

(*I*) **Cancer**.—A third of the cases of cancer of the stomach are found, on opening the abdomen, to be inoperable as a result of metastases We do not refuse to operate for a cancer because of adhesions, or because of its extent, there is nearly always a reason for the use of the knife The operation is, without doubt, more serious and longer but gastrectomy is so superior to gastro-enterostomy that it should be tried at all costs Notwithstanding the extent of our technique for radical operations a great number of cases are still inaccessible to the surgeon because of secondary nodules in the peritoneum or in the liver Before operation metastases should be feared when the patient shows signs of muscular rigidity of the abdominal wall, or a slight ascites or an abdomen of normal appearance—*i.e.* not retracted (Tansini's sign)

The results obtained by gastrectomy for cancer are hardly encouraging Resections give an immediate mortality of 20 per cent survival is relatively poor one year on the average, sometimes many years, but on the contrary recurrence occurs sometimes at the end of seven or eight months I do not give the name of 'cancers' to 'callous ulcers' which the microscope shows on the way to neoplastic change (20 per cent) These give excellent immediate and later results

* See Vol. I Practical Surgery Illustrated, p 211 *et seq*

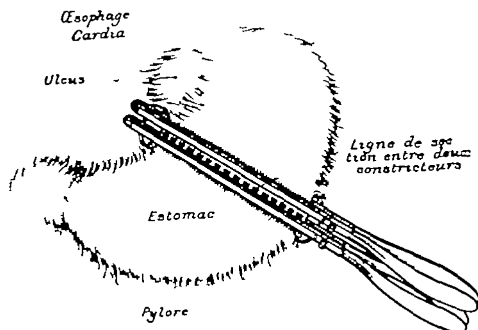


FIG. 64.—ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

The small and the great omentum have been stripped with a compress the vessels have been tied. Two clamps (Collin) are applied; the stomach is divided between them. The object of the surgeon is to resect the cuneiform part of the stomach, the base of which will include the ulcer The upper part of the great tuberosity will be anastomosed end to-end with the pyloric portion.

Œsophage = Œsophagus *Cardia* = Cardia. *Ulcus* = Ulcer *Ligne de section entre deux constricteurs* = Line of incision between two clamps *Estomac* = Stomach. *Pylore* = Pylorus

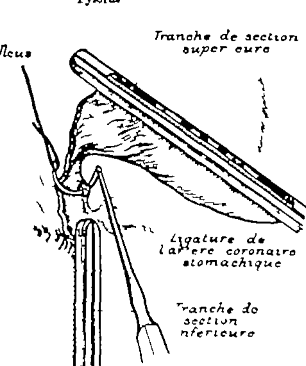


FIG. 65.—ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

The stomach having been divided between two clamps, the operator ties the coronary artery

Ulcus = Ulcer *Tranche de section supérieure* = Edge of the upper incision *Ligature de l'artère coronaire stomachique* = Ligature of the coronary artery *Tranche de section inférieure* = Edge of the lower incision

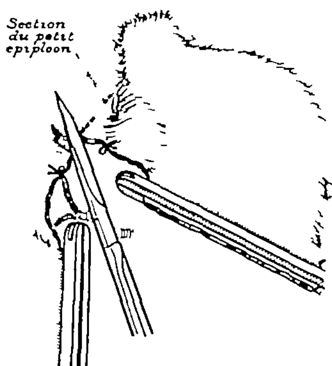


FIG 66.—ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

The coronary artery is tied; the operator divides the small omentum as far as the œsophagus. The technique which corresponds to these figures ought to be compared with that carried out differently in three other cases nearly similar following this set of figures, pp. 85, 86.

Section du petit épiploon = Division of the small omentum

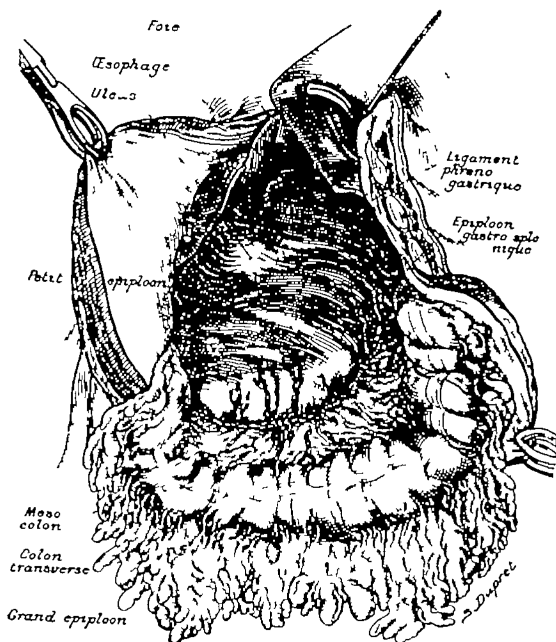


FIG 63 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

To reach this ulcer a paracostal incision has been made (p 69) with resection of the left costal cartilages. On this oblique incision another incision has been branched off so that the abdominal incision takes the form of a T or rather of an open umbrella There is, then, considerable space, which allows of a view of the stomach up to the cardia. The ulcer is clearly seen.

Foie = Liver *Ligament phreno-gastrique* = Gastro-phrenic ligament *Œsophage* = Œsophagus *Epiploon gastro-splénique* = Gastro-splenic omentum *Ulcus* = Ulcer *Petit épiploon* = Small omentum *Méso-côlon* = Meso-colon. *Côlon transverse* = Transverse colon *Grand épiploon* = Great omentum

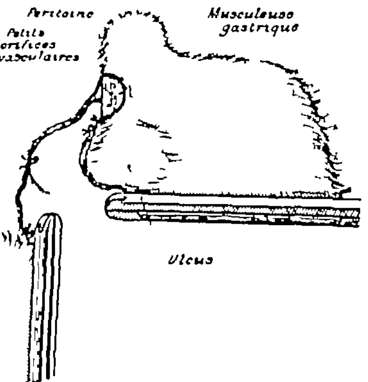


FIG. 69 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

This figure shows the appearance of the lesser curvature after the small omentum has been divided and the remains of the lesser curvature have been freed by brushing with the compress.

Péritoine = Peritoneum *Musculeuse gastrique* = Muscular tissue of the stomach. *Petits orifices vasculaires* = Small openings of vessels *Ulcus* = Ulcer

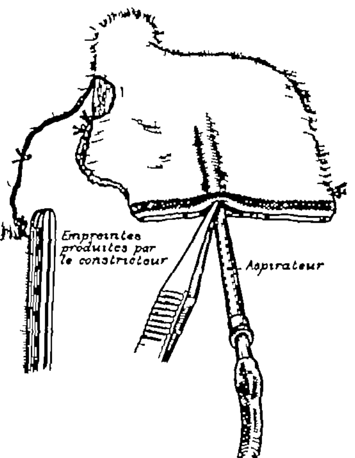


FIG 70 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

The clamp or the écraseur being withdrawn to facilitate the other manipulations, it is necessary to draw off the saliva or the blood in the stomach.

Empreintes produites par le constricteur = Marks made by the clamp *Aspirateur* = Aspirator

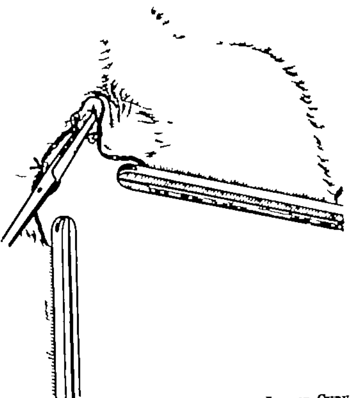


FIG 67 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

After the section of the small omentum, the stomach does not yet descend; the compress, whilst tearing the small vessels, strips the stomach from the omentum. The two crushing jaws, which close the cut extremities of the stomach, may be those of two blades (Collin) of Th. de Martel's écraseur With this latter instrument the edge which projects is flattened and practically aseptic; the instrument consisting only of its jaws, does not incommode the field of operation.

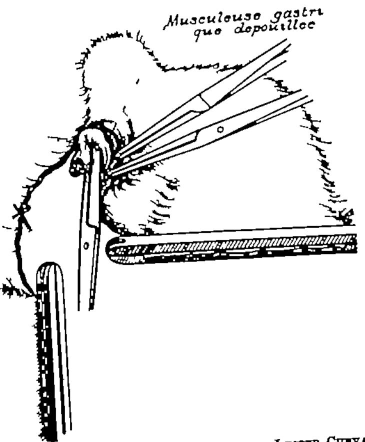


FIG 68 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

Stripping of the smaller curvature terminated Some torn vessels of the gastric muscular tissue bleed; they should be caught immediately because hæmostasis would be impossible at the end of the operation.

Musculeuse gastrique "dépouillée—The muscular tissue of the stomach stripped.

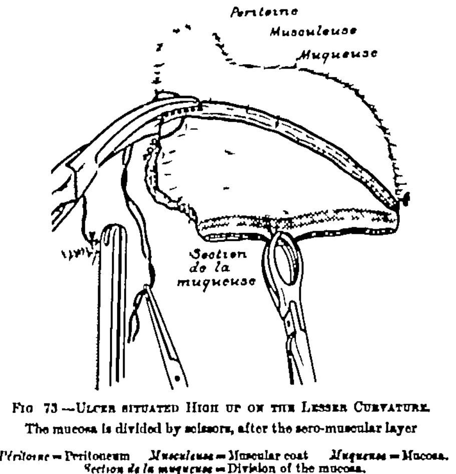


FIG 73 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

The mucosa is divided by scissors, after the sero-muscular layer

Péritoine = Peritoneum *Musculeuse* = Muscular coat *Muqueuse* = Mucosa. *Section de la muqueuse* = Division of the mucosa.

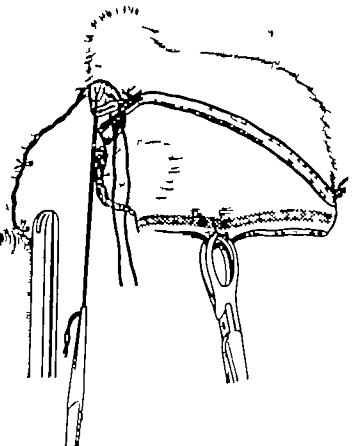


FIG 74 —ULCER SITUATED HIGH UP ON THE LESSER CURVATURE

As the mucosa is divided it is important to close gradually the opening with interrupted stitches, because at the end of the gastric resection it is possible the coats of the stomach may retract at the diaphragm which makes the closure impossible. Compare the suture, which is here difficult to make, with that of a case where the tissues could be brought more outside (p. 91)

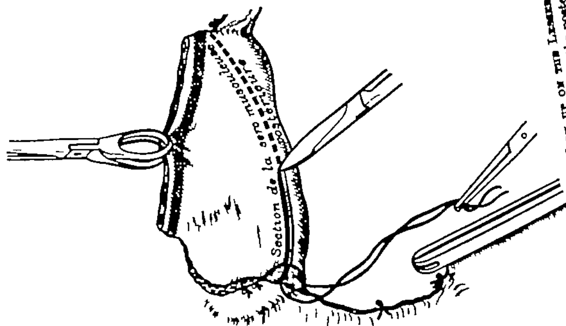


Fig 72.—Ulcer situated High up on the Lesser Curvature.
The sero-muscular incision is continued on the posterior surface of the stomach.

Section de la séro-musculeuse postérieure.—Division of the posterior sero-muscular coat.

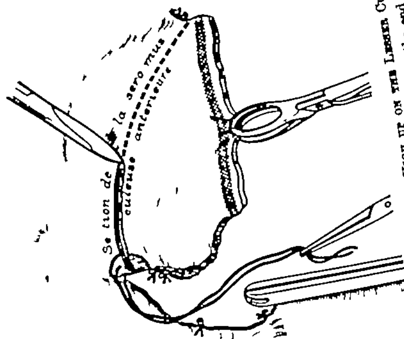


Fig 71.—Ulcer situated High up on the Lesser Curvature.
Division of the stomach. A thread is placed at the end of the lesser curvature so that it should not be retracted on the side of the diaphragm. The operator only divides the anterior sero-muscular coat, and afterwards the posterior.

Section de la séro-musculeuse antérieure.—Division of the anterior sero-muscular coat.

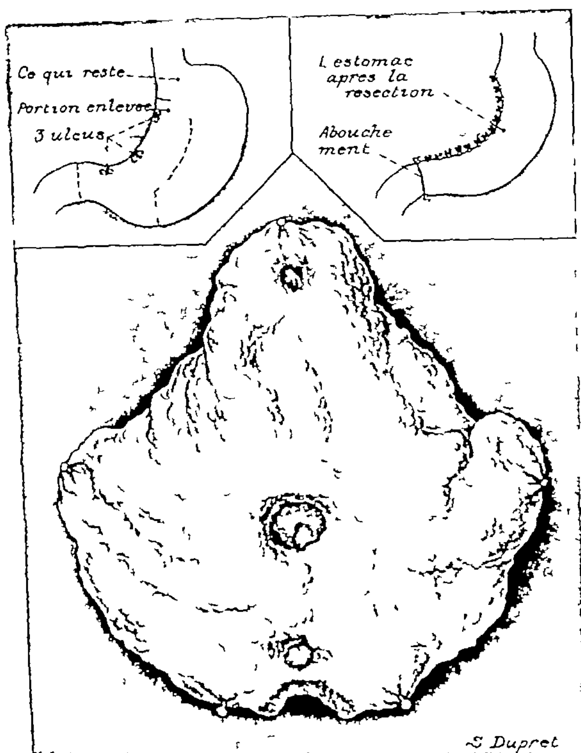


Fig. —

High resection of the stomach. This figure is a specimen of three ulcers, one above the other along the lesser curvature. The lowest is immediately above the duodenum. The drawings above the piece show the operation which has been performed

Ce q[illegible] r[illegible] = Part remaining *Portion enlevée* = Portion removed *3 ulcus* = Three [illegible]lcers *L estomac après la résection* = The stomach after resection *Abouchement* = Anastomosis

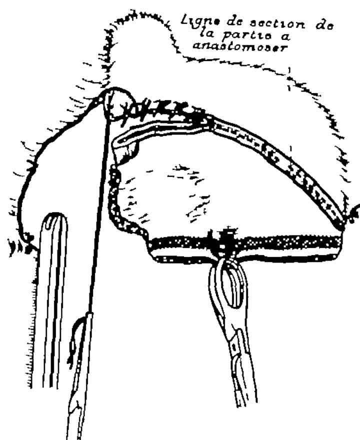


FIG 75.—ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

About a third of the gastric edge has been sutured by interrupted stitches, and also five or six stitches to the serous surfaces have been applied above the first, before continuing the division.

Ligne de section de la partie à anastomoser = Line of division of the part to be anastomosed.

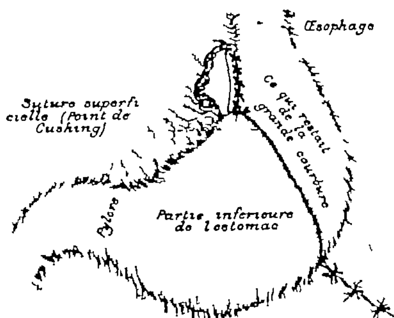


FIG 76.—ULCER SITUATED HIGH UP ON THE LESSER CURVATURE.

The operation is finished.

Œsophage = Œsophagus *Suture superficielle (Point de Cushing)* = Superficial suture (Cushing's stitch). *Ce qui restait de la grande courbure* = The remains of the greater curvature *Pylore* = Pylorus *Partie inférieure de l'estomac* = Lower part of the stomach

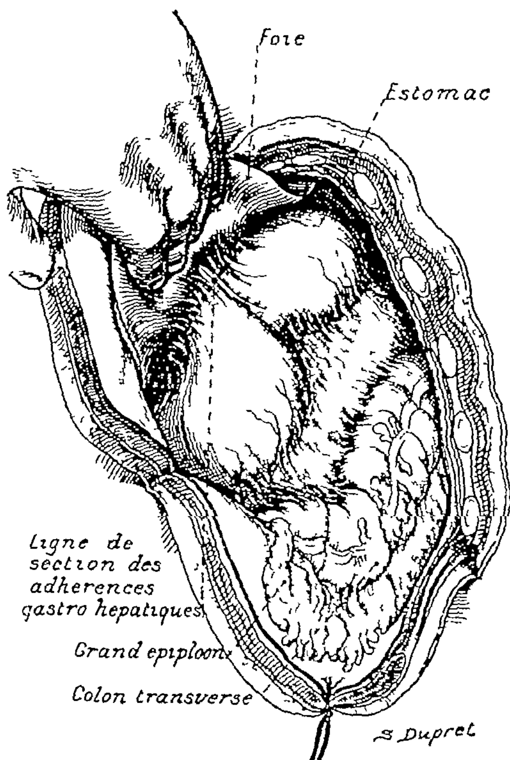


FIG 80 —GASTRECTOMY FOR ULCER HIGH UP

Note the enormous space given by the T incision, combined with section of the costal cartilages. The ulcer adheres to the left lobe of the liver The stomach is reduced to the small pocket, which is visible The cardia corresponds to the division of the costal cartilages. The dotted line indicates the adhesions which will be cut to free the stomach.

Foie = Liver *Estomac* = Stomach *Ligne de section des adhérences gastro-hépatiques* = Line of division of the gastro-hepatic adhesions *Grand épiploon* = Great omentum *Colon transverse* = Transverse colon.[1]

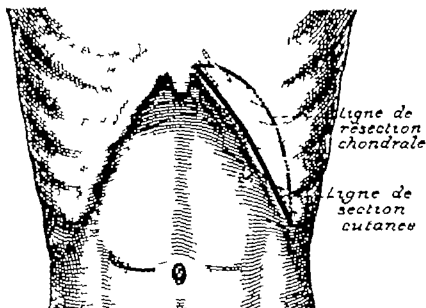


FIG 78.—GASTRECTOMY FOR ULCER HIGH UP

Left laparotomy The resection of the cartilages gives space; it is necessary to have recourse to it in certain cases of narrow thorax, where the lesion is situated high up.

Ligne de résection chondrale = Line of resection of the costal cartilages *Ligne de section cutanée* = Line of cutaneous incision.

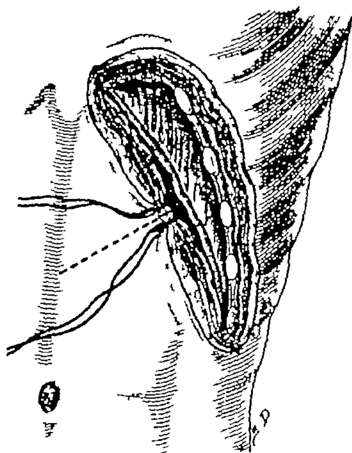


FIG 79.—GASTRECTOMY FOR ULCER HIGH UP

Opening the abdomen. Enlargement of the wound. The two stitches are for the purpose of marking out the angles to facilitate reunion when the abdomen is closed.

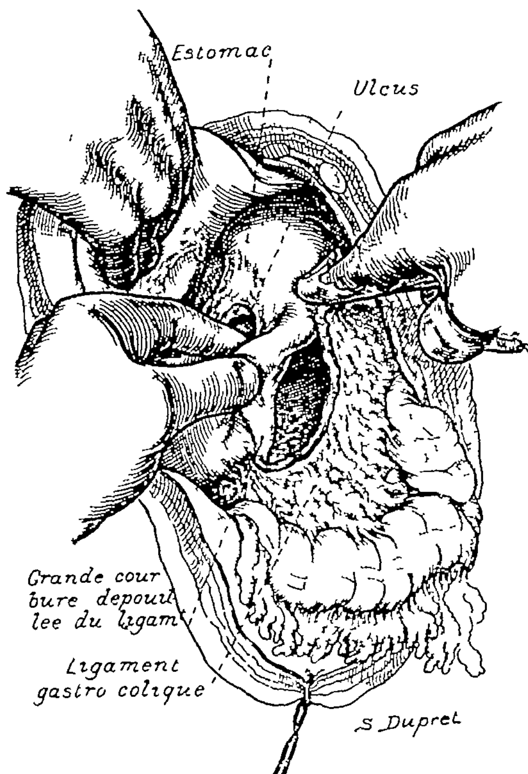


FIG. 82.—GASTRECTOMY FOR ULCER HIGH UP

Stripping the greater curvature by brushing (Temoin) with the compress. Note under the hand of the assistant—left lobe of the liver—the ulcer has perforated into the hepatic tissue. The right hand of the operator brushes the greater curvature in order to strip it; the pancreas is seen at the bottom of the wound below the omentum; the stomach is completely emptied and dried; these manœuvres are possible without discharge of a drop of liquid. A compress is generally placed in the opening in the stomach.

Estomac = Stomach *Ulcus* = Ulcer *Grande courbure dépouillée du ligament* = Greater curvature stripped of its ligament *Ligament gastro-colique* = Gastro-colic ligament

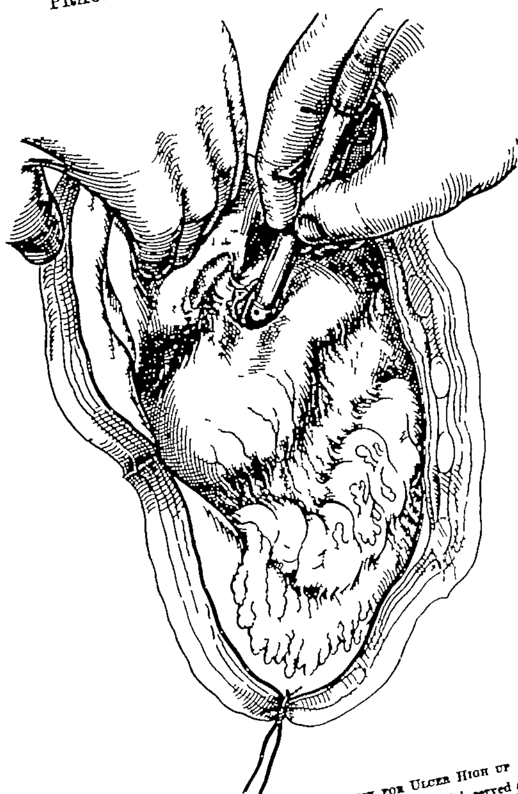


FIG 81 —GASTRECTOMY FOR ULCER HIGH UP

iration of the fluid in the stomach. In the case which served as a model for these drawings the aspirator drew off more than half a pint of blood stained liquid No gastro-enterostomy forceps could arrest the discharge because the upper pocket was oo narrow and retracted It was impossible to use clamps. The stomach had, herefore, to be dried completely This was perfectly accomplished by the aspirator hich first emptied the upper pocket and then the lower

Open.

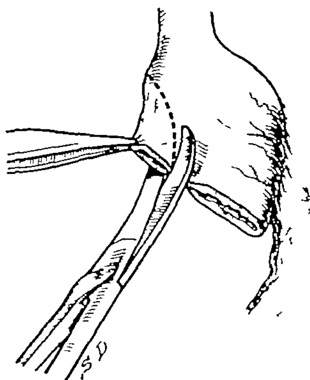


FIG 85.—GASTRECTOMY FOR ULCER HIGH UP

Second stage of the gastric resection. The stomach being cut across, the indurated portion is excised secondarily by scissors. Not a drop of liquid has escaped from the stomach, owing to the aspirator. If swallowing the saliva moisten the gastric mucosa, there is not sufficient of it to flow into the abdomen.

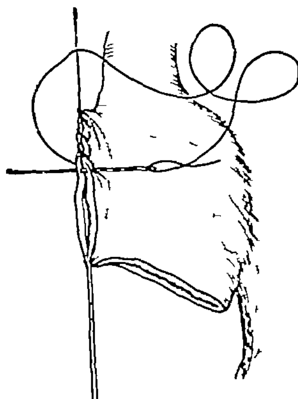


FIG 86.—GASTRECTOMY FOR ULCER HIGH UP

Repair of the opening corresponding to the resection of the lesser curvature. It is necessary to place previously a thread, seen below and to the left, so as to mark out well the edge of the gastric division. The ordinary catgut continuous suture here employed does not penetrate; a Cushing's stitch applied by a curved needle is introduced above it. (These two figures apply to cases in which the tissues can be exteriorised, since the opening should be closed (Fig. 74) by degrees as the mucosa is divided.)

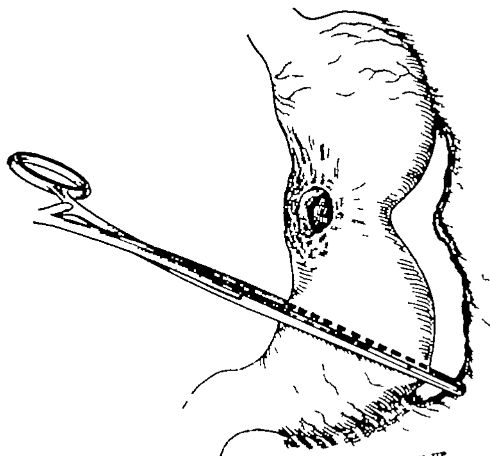


FIG. 83.—GASTRECTOMY FOR ULCER HIGH UP

The case is one of anachlorhydria; therefore, all that is possible of the lower pocket must be preserved. A clamp is placed on the small tuberosity which will be divided by the knife. The clamp runs the risk of slipping, an untoward accident of which there is no fear with the écraseur or with the forceps. The omentum has been freed by the compress, as far as the tissues which will be preserved.

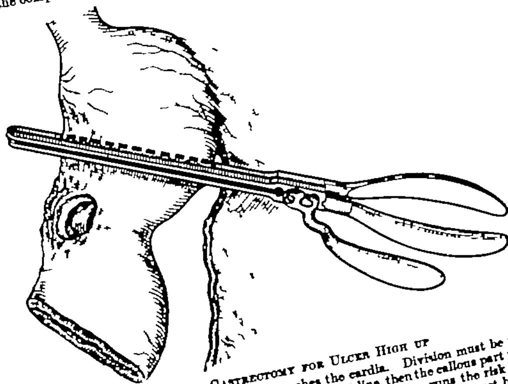


FIG 84.—GASTRECTOMY FOR ULCER HIGH UP

The induration surrounding the stomach reaches the cardia. Division must be made in two stages first, close to the écraseur in a straight line, then the callous part reaching the cardia is excised secondarily The whole division in one runs the risk of being irregular and as much as possible of the tissues of the cardiac pocket must be spared, this section must be made carefully The dotted line shows the operator has been compelled to use the knife above the instrument, which has caused a rectilinear division

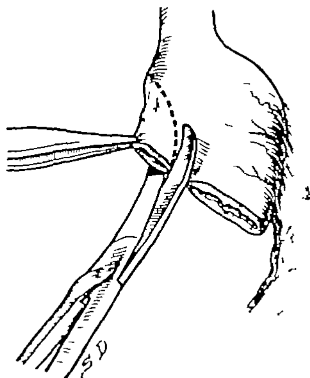


FIG 85.—GASTRECTOMY FOR ULCER HIGH UP

Second stage of the gastric resection. The stomach being cut across, the indurated portion is excised secondarily by scissors. Not a drop of liquid has escaped from the stomach owing to the aspirator If swallowing the saliva moisten the gastric mucosa there is not sufficient of it to flow into the abdomen.

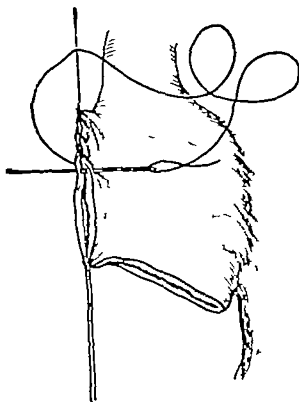


FIG 86.—GASTRECTOMY FOR ULCER HIGH UP

Repair of the opening corresponding to the resection of the lesser curvature It is necessary to place previously a thread, seen below and to the left, so as to mark out well the edge of the gastric division. The ordinary catgut continuous suture here employed does not penetrate a Cushing s stitch applied by a curved needle is introduced above it (These two figures apply to cases in which the tissues can be exteriorised, since the opening should be closed (Fig 74) by degrees as the mucosa is divided.)

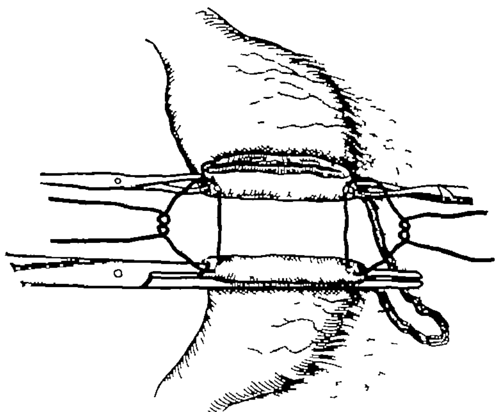


Fig 87.—Gastrectomy for Ulcer High up

After excision and repair of the lesser curvature, the upper pocket of the stomach presents the appearance of a normal gastric pocket, exactly like that resulting from an annular resection of an hour glass stomach. The reader will note, however the black line which corresponds to the suture. The thread is invisible, as when Cushing's stitch is employed the latter is very favourable to repair The two pockets of the stomach are brought into contact. Two fixation stitches with linen thread are applied. It is necessary to pass a second thread, because the two pockets are often unequal, the upper pocket being much narrower than the lower

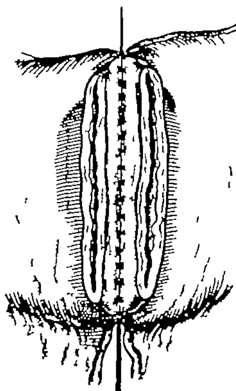


Fig. 88.—Gastrectomy for Ulcer High up

The posterior serous surfaces have been brought into apposition by interrupted stitches in such a way as to compensate for the inequality in breadth between the two pockets.

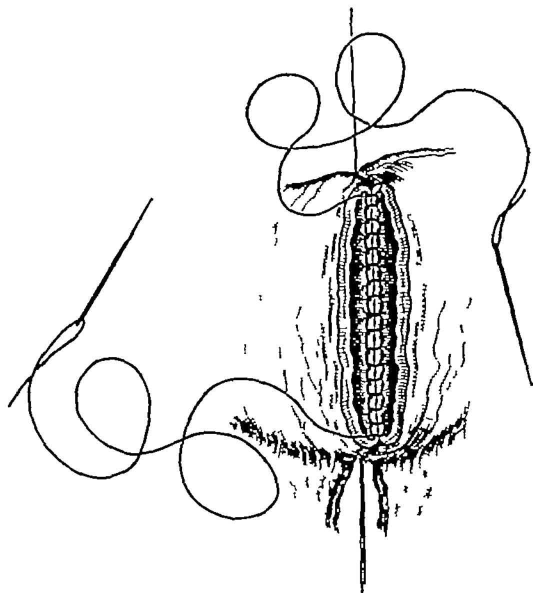


FIG. 80—GASTRECTOMY FOR ULCER HIGH UP

Upper through and through button hole stitch. The operator makes use of two needles, but only one thread. The suture has been begun just in the centre of the opening

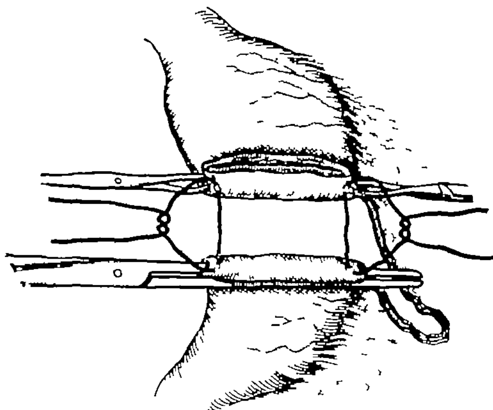


Fig 87 —Gastrectomy for Ulcer High up

After excision and repair of the lesser curvature, the upper pocket of the stomach presents the appearance of a normal gastric pocket, exactly like that resulting from an annular resection of an hour glass stomach. The reader will note, however the black line which corresponds to the suture. The thread is invisible, as when Cushing's stitch is employed; the latter is very favourable to repair The two pockets of the stomach are brought into contact. Two fixation stitches with linen thread are applied. It is necessary to pass a second thread, because the two pockets are often unequal the upper pocket being much narrower than the lower

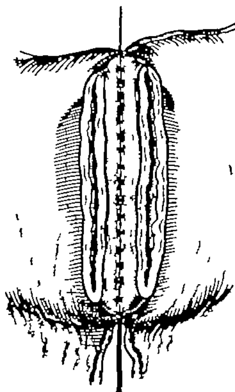


Fig 88.—Gastrectomy for Ulcer High up

The posterior serous surfaces have been brought into apposition by interrupted stitches, in such a way as to compensate for the inequality in breadth between the two pockets.

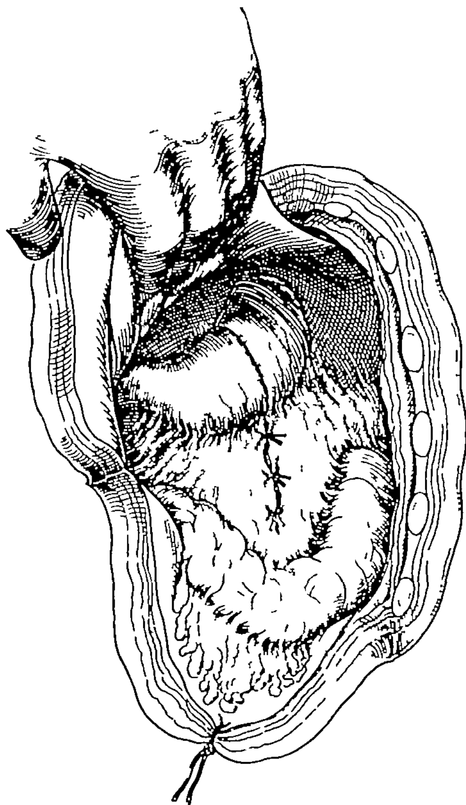


Fig 92.—Gastrectomy for Ulcer High up

Gastrectomy followed by end to-end gastro-gastrorrhaphy is finished. The reader will note on the one hand, the relative invisibility of the suture which brings together the lesser curvature after excision of the ulcer; on the other the thread joining the two gastric pockets. As the operator has proceeded posteriorly by interrupted sutures, he has re-established the harmony between the size of the upper and lower pocket.

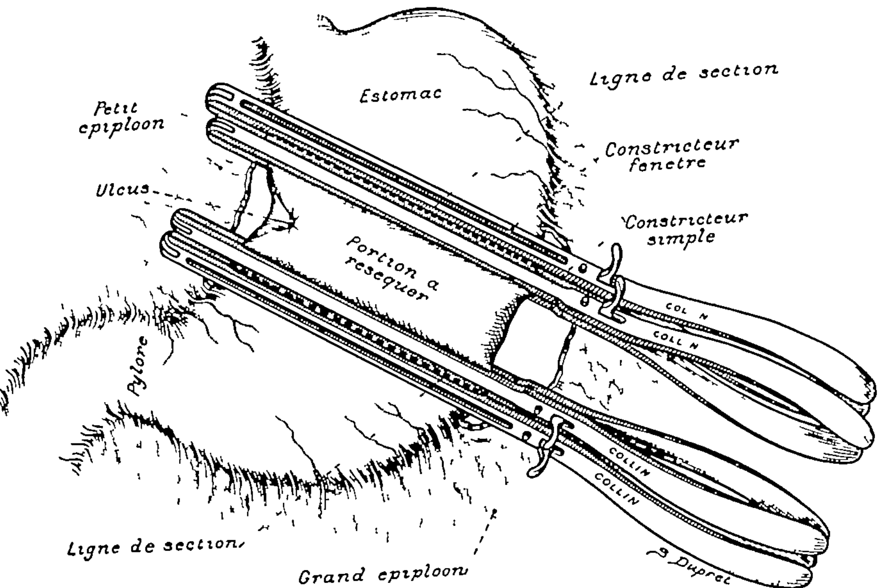


FIG 93 —ANNULAR GASTRECTOMY (SLEEVE METHOD)

How the clamp is placed before resection. The dotted line shows where the incision is made by the knife. The two omenta have been freed by brushing with the compress.

Petit épiploon = Small omentum *Estomac* = Stomach *Constricteur fenêtré* = Perforated clamp. *Grand épiploon* = Great omentum. *Ligne de section* = Line of division *Constricteur simple* = Simple clamp. *Ulcus* = Ulcer *Pylore* = Pylorus *Portion à réséquer* = Part to be resected *Ligne de section* = Line of section

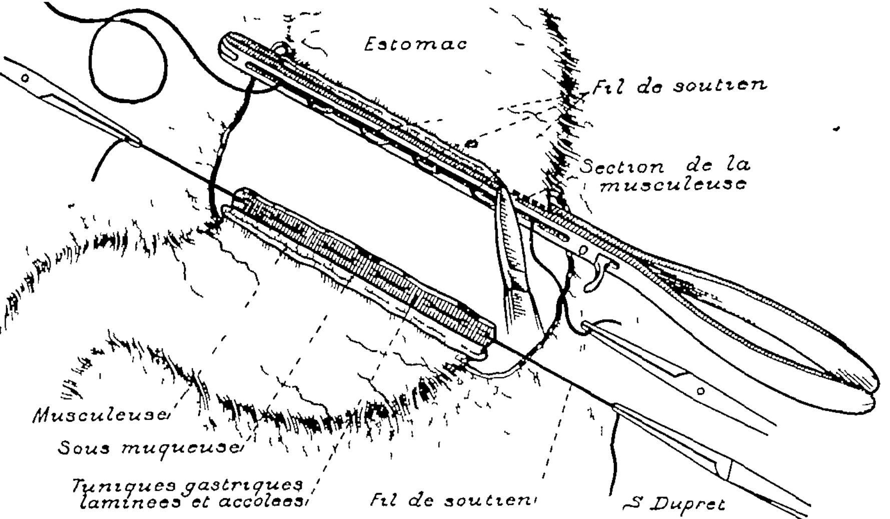


Fig 91.—Annular Gastrectomy (Sleeve Method)

The part is resected. The two gastric stumps preserve their anatomical position. The knife divides the serous and the muscular coat close to the two clamps. The lower clamp has been removed; only the crushed part remains this portion includes the three coats of the stomach. A thread is passed into the window of the instrument to prevent separation of the crushed surfaces. The thread which maintains this apposition is stretched by two forceps.

Estomac = Stomach *Fil de soutien* = Fixation thread *Section de la musculeuse* = Division of the muscular coat *Musculeuse* = Muscular coat *Sous-muqueuse* = Submucosa. *Tuniques gastriques laminées et accolées* = Gastric coats flattened and brought together

FIG. 93.—ANNULAR GASTRECTOMY (SLEEVE METHOD). Used in cases of hypertrophy of the gastric coats. Division of the sero-muscular coat close to the upper clamp.

Face antéri re de l' stomac = Anterior urface of the tomach F ce postérieure d l' stomac = Posterior surface of the tomach Section de la muscul use postre = Division of the posterior muscular coat Fil de soutien = Fixation thread Pet t épiploon = Small omentum Musculeuse = Muscula coat Sous-muqueuse = Submucous coat. Tuniques laminées = Flattened coats Grand épiploon = Great omentum

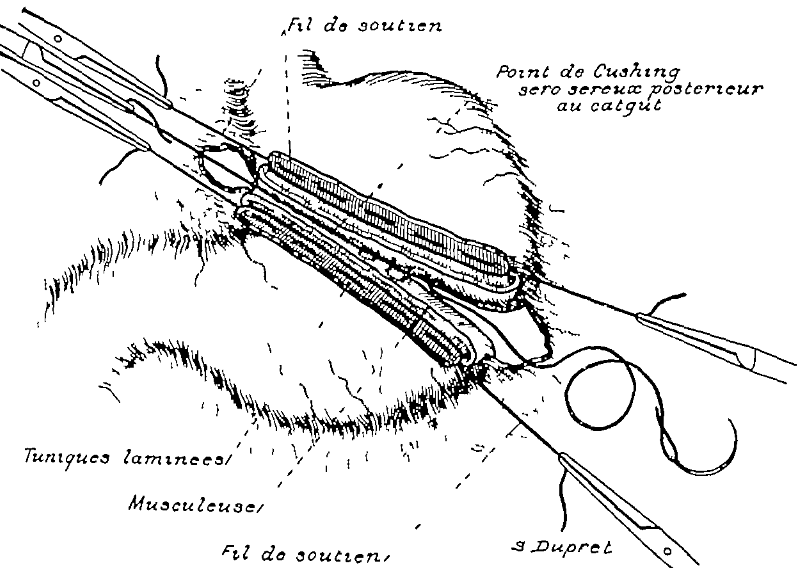


Fig 60.—Annular Gastrectomy (Sleeve Method)
The two gastric stumps are brought in contact; Cushing's stitch is made with a curved needle
Fil de soutien = Fixation thread *Point de Cushing séro-séreux postérieur au catgut* = Posterior sero-serous Cushing's stitch of catgut.
Tuniques laminées = Flattened coats *Musculeuse* = Muscular coat.

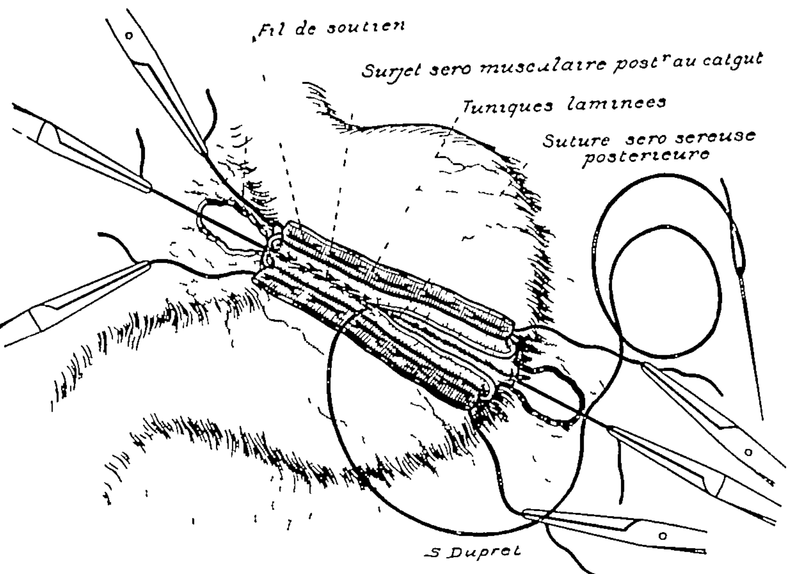


FIG 97 —ANNULAR GASTRECTOMY (SLEEVE METHOD).
The two posterior serous coats have been brought into appoaition by Cushing's stitch by catgut. The two posterior sero-muscular lips are also apposed by a catgut continuous suture. It is easier to reunite, in this way the two muscular edges. These two levels are sufficient to keep the ends of the stomach together

Fil de soutien = Fixation stitch. *Surjet séro-musculaire postr au catgut* = Posterior sero-muscular continuous suture with catgut *Tuniques laminées* = Flattened coats. *Suture séro-séreuse postérieure* = Posterior sero-serous suture.

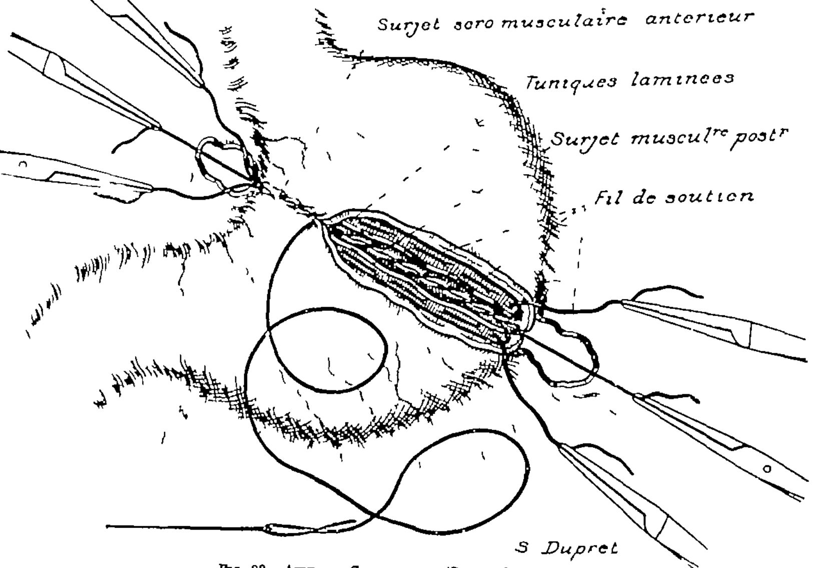


FIG 98.—ANNULAR GASTRECTOMY (SLEEVE METHOD)

The anterior and posterior surfaces of the anterior gastric coats have been brought into apposition. Here the reader will see the anterior sero-muscular continuous suture. He will note, below the posterior sero-muscular continuous suture and the two crushed surfaces held in contact by the threads. Each of these latter threads is held by forceps; at the end of the operation it is sufficient to remove the forceps and to draw on the ends of the thread to complete the apposition.

Surjet séro musculaire antérieur=Anterior sero muscular continuous suture *Tuniques laminées*=Flattened coats *Surjet musculre postr* =Posterior muscular continuous suture *Fil de soutien*=Fixation thread

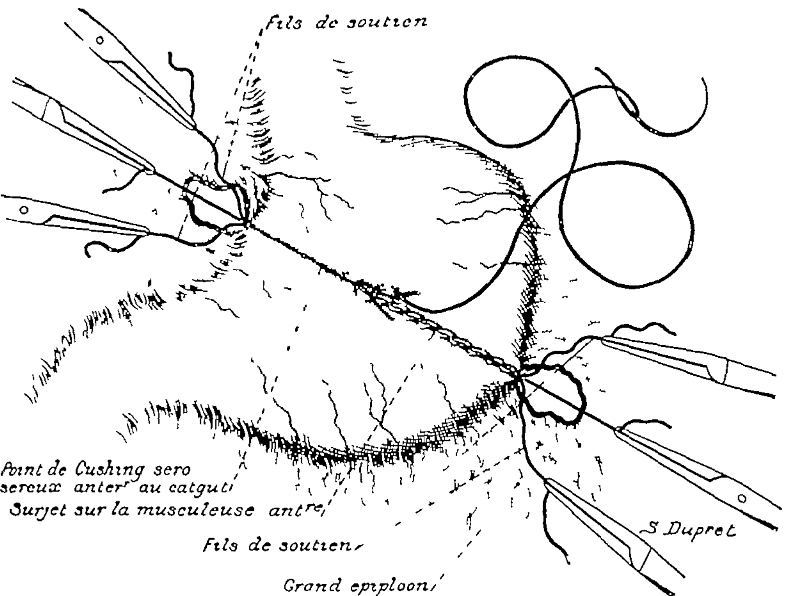


FIG 99 — ANNULAR GASTRECTOMY (SLEEVE METHOD)

The anterior continuous suture to the serous surfaces is made by Cushing's stitch with catgut. When it is finished, the threads which fix the crushed surface will be removed. It is sufficient to remove one of the forceps from the left or from the right hand, and to draw on the opposite border

Fils de soutien = Fixation threads *Point de Cushing séro-séreux anter au catgut* = Cushing's stitch with catgut to the anterior serous surfaces *Surjet sur la musculeuse antre.* = Continuous suture of the anterior muscular coat *Grand épiploon* = Great omentum

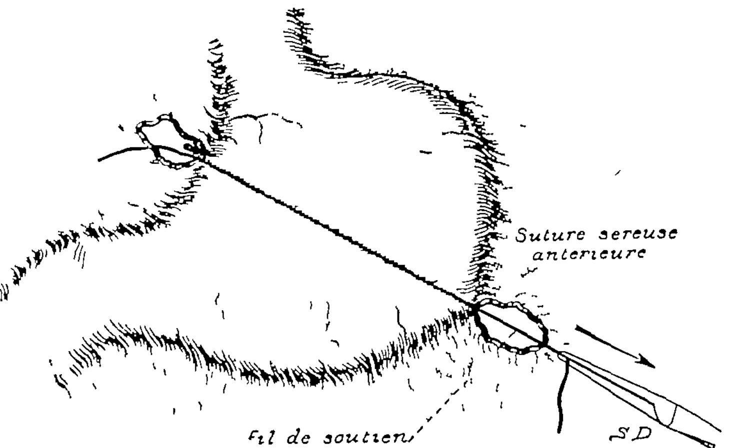


Fig 100 —Annular Gastrectomy (Sleeve Method)

The anterior serous suture is finished. One of the two fixation stitches remains. The arrow indicates in which direction the thread ought to be drawn.

Suture séreuse antérieure = Anterior serous suture *Fil de soutien* = Fixation thread

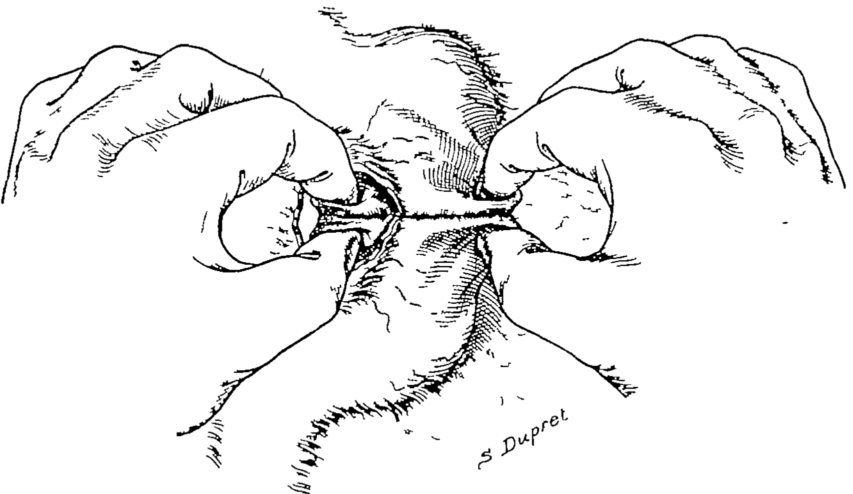


FIG 101.—ANNULAR GASTRECTOMY (SLEEVE METHOD).

The gastric suture is finished. Note the thread in the serous surfaces is invisible owing to Cushing's stitch. The fingers stretch the two crushed edges and allow the two gastric surfaces to come together

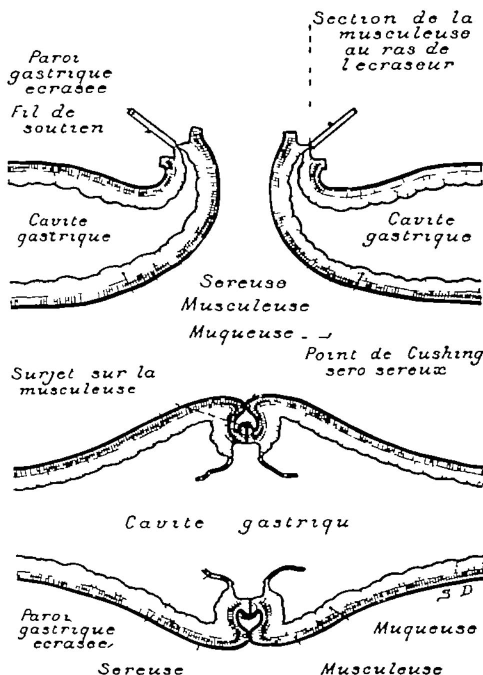


FIG. 102.—ANNULAR GASTRECTOMY (SLEEVE METHOD).

Drawings indicating the condition of the gastric edges before and after suturing. The drawing above corresponds to Figs. 96 and 97 once the two clamps have been entirely removed. The drawing below corresponds to Fig. 101 when the fingers have stretched the crushed surfaces. The empty space indicated between the two rows of sutures for the sake of clearness does not, in reality exist

Paroi gastrique écrasée = Crushed gastric wall *Section de la musculeuse au ras de l'écraseur* = Division of the muscular coat close to the écraseur *Fil de soutien* = Fixation thread *Cavité gastrique* = Cavity of the stomach. *Séreuse* = Serous coat. *Musculeuse* = Muscular coat *Muqueuse* = Mucous coat. *Surjet sur la musculeuse* = Continuous suture of the muscular coat *Point de Cushing séro-séreux* = Serous suture: Cushing's stitch.

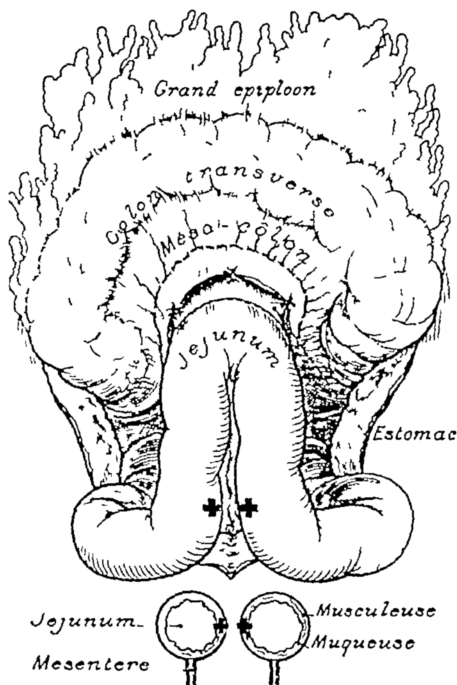


FIG 103 —GASTRO ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON

The crosses indicate the position of the buttons on the intestine (jejunal loop of 25 centimetres).

Grand épiploon = Great omentum *Côlon transverse* = Transverse colon *Méso-côlon* = Meso-colon *Jéjunum* = Jejunum *Estomac* = Stomach. *Mésentère* = Mesentery *Musculeuse* = Muscular coat *Muqueuse* = Mucosa

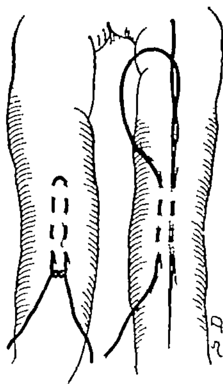


FIG. 104.—GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON
Three stitches are running stitches, with slowly absorbable catgut 000

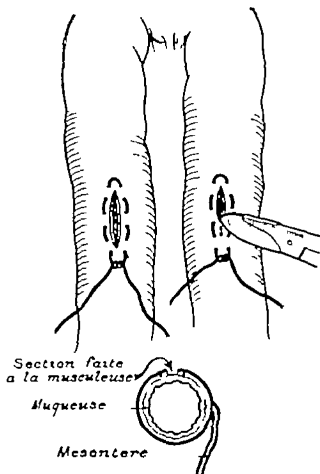
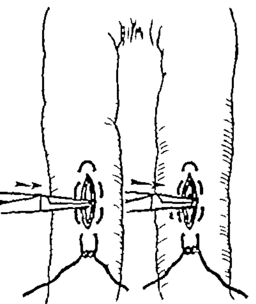


FIG. 105.—GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON
The knife incises the serous and the muscular layers the mucosa is seen at the bottom of the incision and is not divided.

Section faite à la musculeuse = Division of the muscular coat *Muqueuse* = Mucosa.
Mésentère = Mesentery



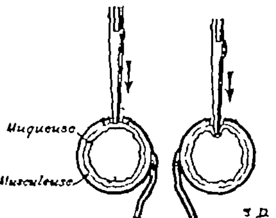
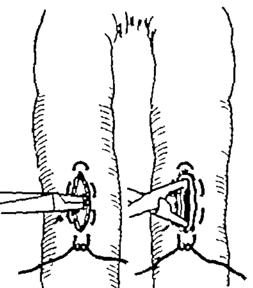


FIG 106 —GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON

How the intestine is opened; Kocher's forceps split the mucosa.



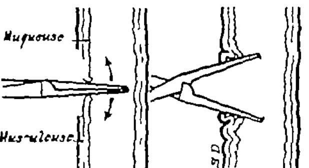


FIG 107 —GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON

Directly Kocher's forceps enter the intestinal cavity it is opened in such a way as to fold back the mucosa and to enlarge the cavity

Muqueuse = Mucosa. Musculeuse = Muscular tissue

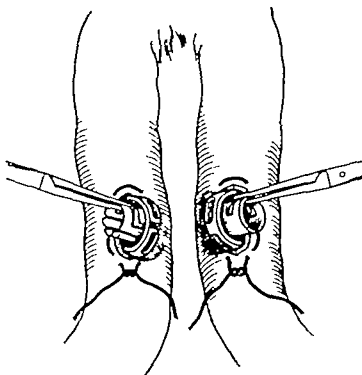


FIG 108.—GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON

Dilatation of the orifice. The forceps allow of the introduction of the two pieces of Villard's button. A piece of Jaboulay's button has been drawn, on the left by mistake.

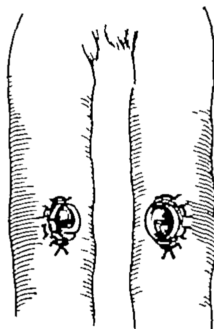
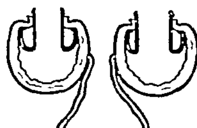


FIG 109.—GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON

The two threads are tightened. At the bottom, the drawing shows the position of the mesentery



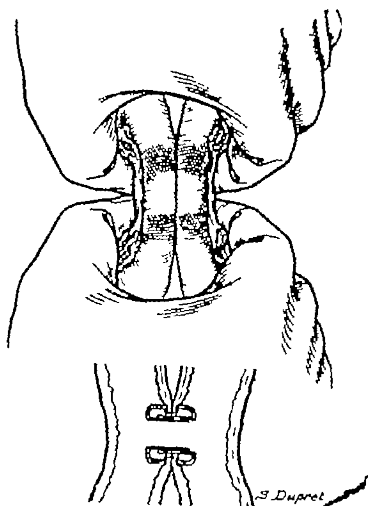


FIG 110.—GASTRO-ENTEROSTOMY WITH JEJUNO-JEJUNOSTOMY WITH A BUTTON

How the two pieces of button are joined. A compress is necessary to diminish the injury resulting from pressure. No complementary suture is necessary.

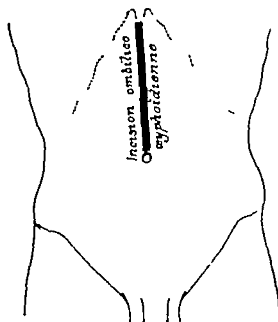


FIG 111.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS. *Median Incision.*
It is sufficient in the majority of cases. It goes from the umbilicus to the xiphoid cartilage

Incision ombilico-xyphoïdienne—Incision from the umbilicus to the xiphoid cartilage.

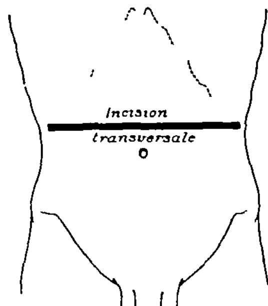


FIG 112.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS. *Transverse Incision.*

This incision allows of an exploration at the same time of the liver the pylorus, the duodenum, the stomach, the gall-bladder and the biliary ducts. During the operation the loops of intestine are easily kept in the abdomen. Closure of this incision is very easy The intestines readily return into the abdomen. When the operation is finished the suture is very firm, more so than with the median incision. Eventration never occurs. The cutaneous part of the opening leaves scarcely any visible trace. Its only fault is, it requires careful hæmostasis, and healing is quite slow

Incision transversale—Transverse incision.

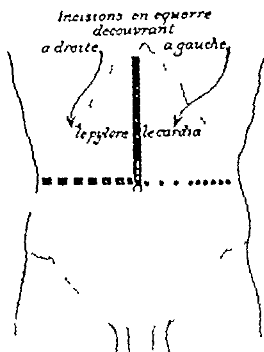


FIG 113.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS. *Square Incision.*
It is used every time the median, vertical incision does not give sufficient space. If the operator require space at the cardia, he branches off an incision to the left; if at the duodenum or at the gall-bladder he incises to the right.

Incisions en équerre découvrant à droite le pylore, à gauche le cardia = Square incisions exposing the pylorus on the right the cardia on the left

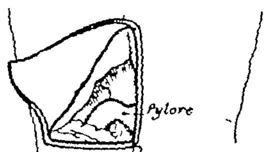


FIG. 114.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS.
Square Incision to the Right
The large space given by this incision. It is applicable in resections of the duodenum in some pyloro-gastrectomies, in gastro-duodenostomy and in cholecystectomies, when complementary to operations on the stomach.

Pylore = Pylorus

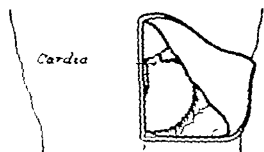


FIG. 115.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS.
Square Incision to the Left
The large space given by this incision. It is applicable in ulcers situated high up on the small curvature and in cases of annular resections.

Cardia = Cardia

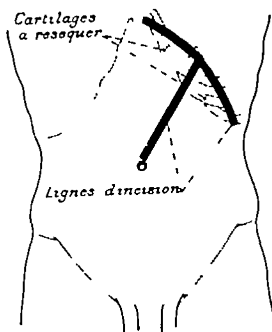


FIG 116.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS.
Left Paracostal Incision.

This incision is for the purpose of reaching ulcers situated high up on the lesser curvature, especially if the thorax be narrow The umbrella incision (curvilinear incision, from which an oblique incision branches off) allows of resection of the costal cartilages. The oblique portion joins the umbilicus and allows of a large space.

Cartilages à réséquer = Cartilages to be resected. *Lignes d'incision* = Lines of incision

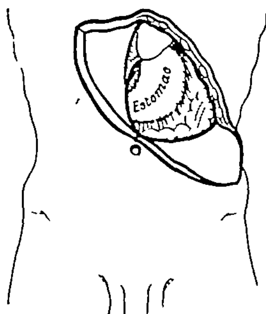


FIG 117.—INCISIONS FOR GASTRIC AND DUODENAL OPERATIONS.
The considerable space in the left hypochondrium, given by the umbrella incision

Estomac = Stomach.

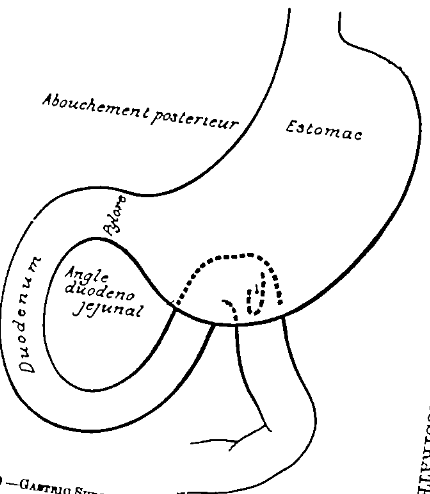


FIG 110 —GASTRIC SURGERY (One of the Good Gastro-Enterostomies). Ricard's method of vertical suspension. The operator takes the intestinal loop where it passes behind the stomach, near to the duodeno-jejunal flexure The loop is as short as possible. The jejunum falls vertically and is easily emptied as the opening is at its dependent position. *Abouchement postérieur* = Posterior anastomosis. *Estomac* = Stomach. *Pylore* = Pylorus *Duodénum* = Duodenum *Angle duodéno-jéjunal* = Duodeno jejunal flexure

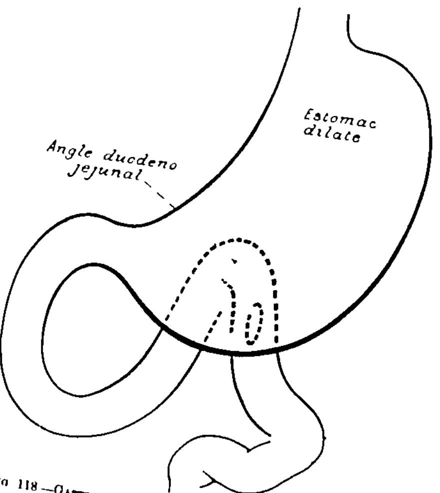


FIG 118 —GASTRIC SURGERY (Imperfect Gastro-Enterostomy) Dilated stomach. The gastro-enterostomy with a short loop has been made as near as possible to the edge of the greater curvature, but too much to the left

Angle duodéno-jéjunal = Duodeno-jejunal flexure *Estomac dilaté* = Dilated stomach.

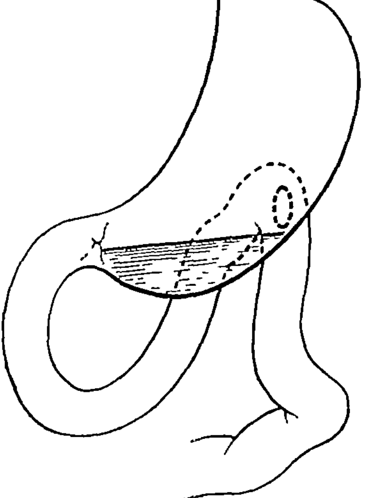


FIG 120.—GASTRIC SURGERY (Imperfect Gastro-Enterostomy).

What happens to the stomach after anastomosis with a short loop, in cases of dilated stomach, too far from the pylorus (Fig 118). The drainage opening should have been made at the dependent point. If it had been situated nearer the greater curvature the orifice would continue to occupy the dependent point (Fig 119)

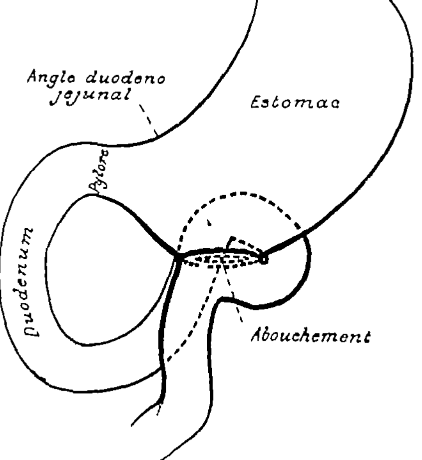


FIG 121.—GASTRIC SURGERY (One of the Good Gastro-Enterostomies).

Gastro-enterostomy with a short loop at the dependent part and marginal. This is the simplest way of making a gastro-enterostomy The anastomosis can be made just at the greater curvature, after stripping the curvature and separation of the great omentum, or quite well on the posterior surface of the stomach, but 1 or 2 centimetres or more above the greater curvature. The opening thus occupies the dependent point, even if the stomach retract.

Angle duodeno-jéjunal = Duodeno jejunal flexure *Pylore* = Pylorus *Estomac* = Stomach. *Duodénum* = Duodenum *Abouchement* = Anastomosis

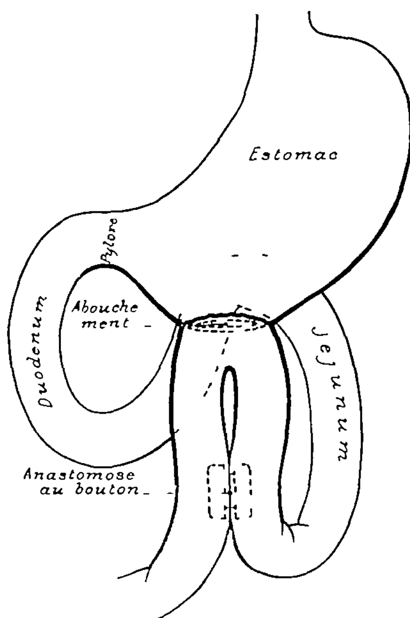


FIG 122.—GASTRIC SURGERY (One of the Good Gastro-Enterostomies).

Gastro-enterostomy with a long loop, with jejuno-jejunostomy with a button. It is a procedure we advise in cases where the short loop does not seem to drain the stomach well. By taking a long loop, and performing jejuno-jejunostomy there is a certainty of not creating a vicious circle. But the surgeon must always start as far as possible from the pylorus and from the greater curvature.

Pylore = Pylorus *Estomac* = Stomach *Abouchement* = Opening *Jéjunum* = Jejunum. *Duodénum* = Duodenum *Anastomose au bouton* = Anastomosis with a button.

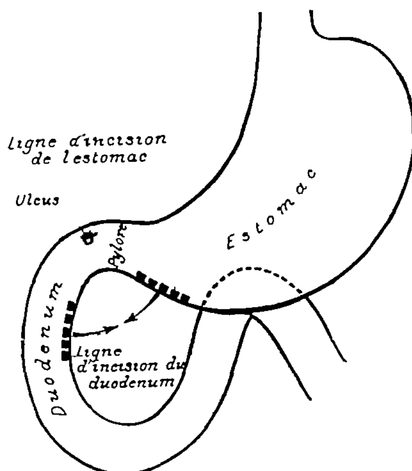


FIG. 123 —GASTRIC SURGERY (Gastro-Duodenostomy)

In cases of duodenal ulcer if the greater curvature of the stomach be movable, or the duodenum easily accessible, gastro-duodenostomy is an excellent operation. It consists in anastomosing the stomach, immediately in front of the pylorus, with the vertical part of the duodenum, as near as possible to its internal border This operation is easier if the pyloric ulcer be first excised, and if the incision be prolonged on the stomach and on the duodenum (Finney).

Ligne d'incision de l'estomac = Line of incision of the stomach. *Ulcus* = Ulcer *Pylore* = Pylorus *Estomac* = Stomach *Duodénum* = Duodenum. *Ligne d'incision du duodénum* = Line of incision of the duodenum

VI

GASTRO-INTESTINAL SURGERY*

EMPLOY the aspirator, the écraseur, the button, glover s needle, local anæsthesia, catgut suture, parallel suture, with hidden stitches, because they have improved the technique of the prognosis of gastro-intestinal operations

The Best Continuous Suture Some Types of Gastro-Enterostomy after Gastrectomy *

For twenty five years, since I have practised gastro-intestinal surgery, I have employed all kinds of suture, and methods of anastomosis I will indicate the procedures which have appeared to me the best, and what is the method of suture (represented by the drawings) which has seemed to me the most perfect from the point of view of hæmostasis, of asepsis, and of continence I have noted a very great improvement in the prognosis in the operations performed in this way as regards both mortality and bad results Local infections and hæmorrhages, or at least hæmorrhagic oozing, no more exist with this procedure †

Is this technique final ? I hope not, because we ought always to progress for the better, but no method of suture has ever given me so much confidence as this one Does it take longer ? One or two minutes or more perhaps Besides, with local or even spinal anæsthesia the question of time is less important

Should linen or catgut suture be used ? For the stomach, slowly absorbable catgut 00 should be preferred For the large and small intestine catgut or linen can be used indifferently

Should the suture be continuous or interrupted ? In nineteen cases out of twenty the continuous suture is preferable, because it is more rapid and more continent But interrupted stitches are useful in the following conditions

* See Practical Surgery Illustrated, by Victor Pauchet, Vol. II., Figs. 139 140 Vol. III Fig 135 English edition. Benn. London, 1924

† Wash all the cases to be operated upon for gastric disease the evening before the operation, and often the day before it is a disagreeable but very useful precaution.

(*a*) When the thickness of the two tunics is disproportionate—*e.g.*, anastomosis of a stomach with thick walls to a thin jejunum

(*b*) When the intestinal walls are friable, if the intestine be sclerosed or œdematous If one stitch, then, cuts or becomes loose the neighbouring one maintains adhesion of the serous surfaces With a continuous suture, if one or two stitches cut the tissues, the whole row of sutures yields

(*c*) When the intestinal openings to be anastomosed are narrow For example, a gastro-duodenostomy by Péan's method is generally better made by interrupted stitches because a thin and narrow *duodenum has to be anastomosed with a thicker stomach* We have often made a continuous suture for a gastro-duodenostomy but we advise interrupted stitches, especially to surgeons who do not often perform this operation

Should dressmakers needles curved fine needles on needle holders, or Reverdin s needle be used ? The three are to be employed Reverdin's needle for interrupted stitches, curved and fine needle for delicate sutures, straight glover s needle in the majority of cases, and in particular for the continuous suture

What method of suture should be employed ? A method of suture which is hæmostatic and does not evert the mucosa to the serous coat suture with mucous loop If the whole level, moreover (anterior border of the anastomosis), be buried under a continuous suture to the serous surfaces, it produces a closed cavity, with septic contents (Th de Martel) even if care be taken to paint with iodine the mucosa which protrudes between the stitches of the suture Every suture should therefore be inverted so that it points towards the gastro-intestinal cavity and the thread is invisible at the peritoneal side Connel s and Cushing s stitch realise these conditions

How many levels of suture should be made ? One level of Connel s stitches should suffice if the patient be feeble, and we are dealing with the small intestine, but two levels (Connel and Cushing) above each other are safer

We for a long time employed three levels of suture We have given it up since we used the suture with invisible stitches

Should crushing be employed ? For a long time we used it systematically then a little less for some months, and then came back to it Crushing is an undoubted improvement

We use the small écraseur of de Martel for the colon, the duck bill forceps of Collin for the duodenum and for the stomach sometimes Collin s clamp sometimes de Martel s écraseur with three limbs

Gastro-Enterostomy after Gastrectomy—Let us suppose an ulcer of the lesser curvature of the stomach, it can be treated by excision, which we have given up, owing to the seriousness of the operation, or by simple thermo-cauterisation (Balfour), which may suffice in some small ulcers of the upper part of the lesser curvature, it is an exceptional procedure We have given up simple gastro-enterostomy because of the inadequacy of the results There remain, then, two operations (*a*) annular resection or the sleeve method, (*b*) gastro-pylorectomy The first only removes a small part of the stomach, the length corresponding to the greatest dimensions of the ulcer, and the second removes at the same time the pylorus, the small tuberosity, and the ulcer

Which of these methods should we employ? That depends on the case (*a*) if the patient suffer from hyperchlorhydria, which is the rule, we should perform gastro-pylorectomy so as to remove as much as possible of the secretory part of the stomach, we in this way lower the quantity of hydrochloric acid, (*b*) if the acidity be normal or below the normal we should perform resection by the sleeve method with end to-end suture of the stomach

We will consider here only the ordinary case—to wit, gastro-pylorectomy—*i.e.*, removal of the pylorus, of the ulcer, and of the small tuberosity

Resection being performed, the duodenum is closed by the procedure we have adopted écrasement, continuous suture to the serous surface above the duck bill forceps of Collin, the instrument is removed, the suture tied, and the edge buried, a single level suffices If it be necessary a fragment of omentum makes all firm

How shall we proceed as regards the stomach? The following cases may occur

(*a*) There is much gastric tissue, the duodenum is small, the stomach should be completely closed and posterior or anterior (Billroth) gastro-enterostomy performed, completed by a jejuno-jejunostomy with a button This is the easiest way

(*b*) There is much gastric tissue and the duodenum is large In this case gastro-duodenostomy by Péan's method should be carried out This end to-end anastomosis is the best

(*c*) The gastric tissue is sufficient, but not excessive A gastro-enterostomy by implantation should be made, as indicated in the figures of this article If the edge of the division be long one-third, one-half, or two-thirds should be removed and the lower open part should be anastomosed with the jejunum If, on the

contrary, the border be not long it should be entirely anastomosed with the jejunum According to the case we have a choice of a short or a long loop, on condition that a jejuno-jejunostomy with a button be added, this secondary anastomosis takes a minute and allows the bile to pass directly into the intestine without passing by the stomach With the same object in view we often recommend other methods, in particular Roux's operation in Y, which is carried out by suture only The annexed figures indicate the different methods we have followed

To sum up, a gastro-enterostomy should be made in two ways—either by end to-end anastomosis by Péan s method, or by gastro-jejunostomy by Billroth's, Polya's, or Roux s method

All the procedures are good They each have their indications It is for the surgeon to judge of the occasion for each at the time of the operation In all the cases the stomach is crushed.

Practised in this way, gastric surgery is of extreme mildness gastro-intestinal operations are not more serious than gynæcological operations, if the mortality rate of the latter has been lowered, it is because the surgeon has acquired great practice in performing it It is the same for gastro-intestinal surgery The mildness depends on the training of the operator

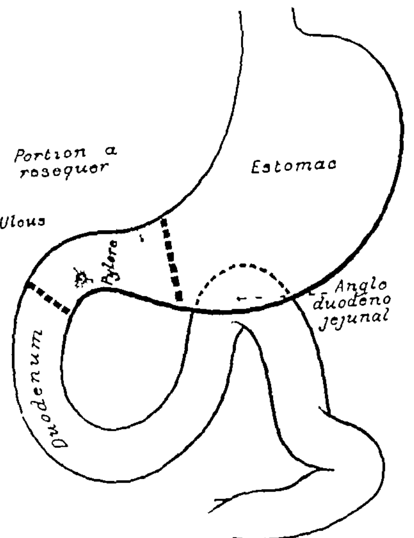


Fig 124 —Gastro-Intestinal Surgery (Gastro-Duodenostomy and Burying the Ulcer).

Three stitches over the ulcer have buried it to prevent rupture. The stomach has been anastomosed with the jejunum. The pylorus is therefore excluded and the gastric contents enter the cavity of the jejunum, which is not accustomed to receive them, hence the possible production of jejunal ulcer It would be simpler and more efficacious to excise the ulcer followed by a gastro-duodenostomy by prolongation of the incision on to the stomach and on to the duodenum (Finney)

Abouchement (Gastro duodenostomie) = Anastomosis (gastro duodenostomy)

Fig 125 —Gastro-Intestinal Surgery (Duodenectomy)

In the case of duodenal ulcer if the case be an easy one, *resection* is certainly *the best operation.* It consists in resection of the diseased part, but the operation must be easy in order to give the best chances of cure. If the patient suffer from hyperchlorhydria, two thirds of the stomach should be removed.

Portion à réséquer = Portion to be resected *Pylore* = Pylorus *Estomac* = Stomach. *Ulcus* = Ulcer *Duodénum* = Duodenum *Angle duodéno-*

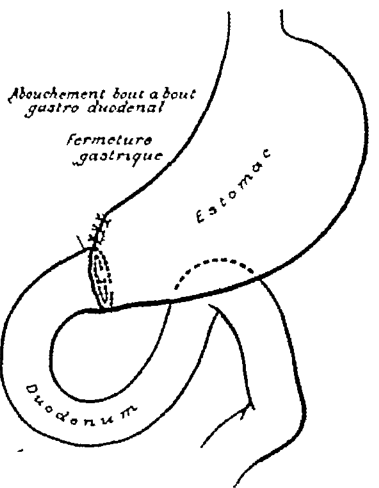


FIG. 126.—GASTRO-INTESTINAL SURGERY (Pyloro-Duodenectomy).

In a case of duodenal ulcer the end to-end anastomosis of Péan has been made. The gastric edge has been slightly contracted because the two ends are unequal in size.

Abouchement bout à bout gastro-duodénal = End to-end gastro-duodenal anastomosis. *Fermeture gastrique* = The closed stomach. *Estomac* = Stomach. *Duodénum* = Duodenum

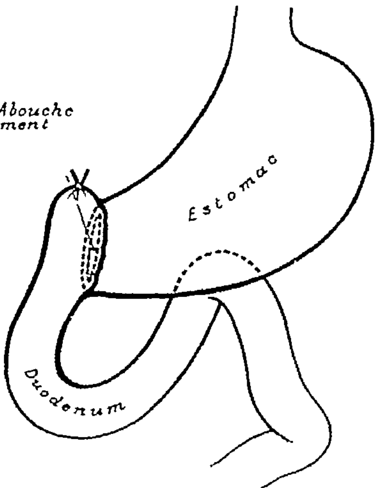


FIG. 127.—GASTRO-INTESTINAL SURGERY (Duodenectomy Completed by a Gastro-Duodenostomy by Implantation).

The duodenum being too small has been closed in a cul-de-sac and the stomach has been implanted in the second part of the duodenum

Abouchement = Anastomosis *Estomac* = Stomach. *Duodénum* = Duodenum

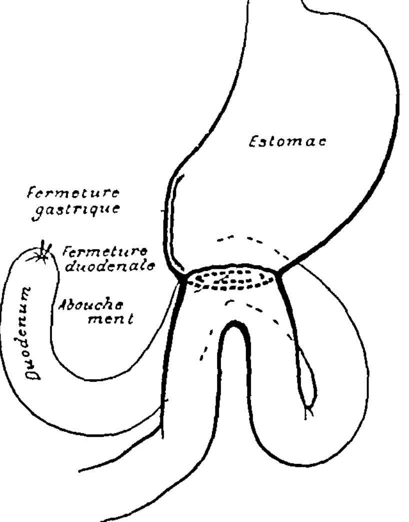


Fig 128.—Gastro-Intestinal Surgery (Pyloro-Duodenectomy for Duodenal Ulcer)

The duodenum and also the stomach have been closed in a cul-de-sac; the gastro-enterostomy has been made at the dependent point.

Estomac = Stomach *Fermeture gastrique* = The closed stomach *Fermeture duodénale* = The closed duodenum. *Duodénum* = Duodenum *Abouchement* = Anastomosis.

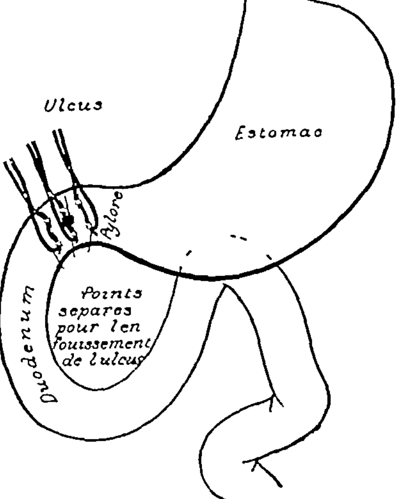


Fig 129.—Gastro-Intestinal Surgery (Perforating Duodenal Ulcer).

How to treat a perforating ulcer of the duodenum. Three stitches generally suffice to obliterate it. A piece of omentum is usually utilised to close it completely. Often the intestine is contracted by the suture; it is then necessary to perform gastro-enterostomy

Ulcus = Ulcer *Estomac* = Stomach. *Pylore* = Pylorus *Duodénum* = Duodenum. *Points séparés pour l'enfouissement de l'ulcus* = Interrupted stitches for burying the ulcer

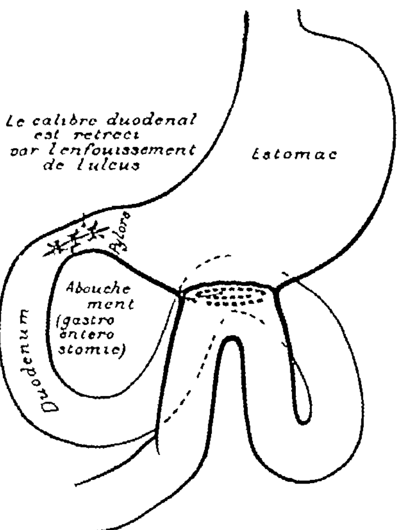


Fig. 130 —Gastro-Intestinal Surgery (Perforating Duodenal Ulcer). The duodenum is contracted as a result of burying the ulcer Gastro-enterostomy is necessary It is made here with a long loop.

Le cal'bre duodénal est rétréci par l'enfouissement de l'ulcus—The diameter of

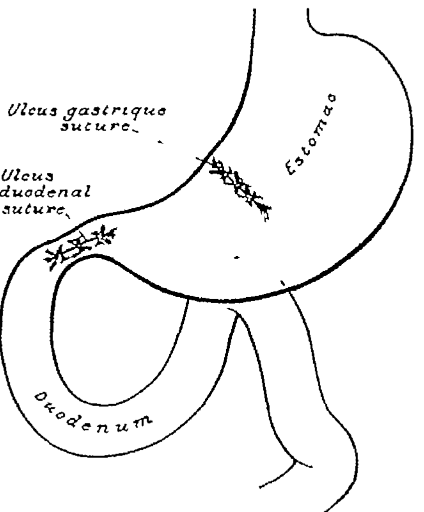


Fig 131 —Gastro-Intestinal Surgery (Combined Gastric and Duodenal Ulcer)

Balfour's operation, and burying the gastric and the duodenal ulcer As the diameter of the duodenum is contracted gastro-enterostomy will be performed. We prefer gastro-pylorectomy which is a mild and efficacious operation, to these two timid and often insufficient

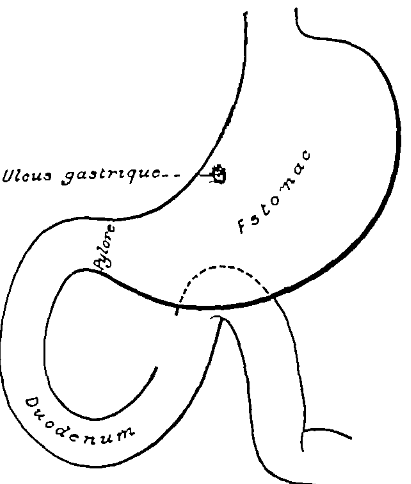


Fig 132.—Gastro-Intestinal Surgery (Cauterisation of the Ulcer).

Ulcer of the small tuberosity of the stomach, which will be treated by thermo-cauterisation (Balfour).

Ulcus gastrique = Gastric ulcer *Estomac* = Stomach *Pylore* = Pylorus *Duodénum* = Duodenum

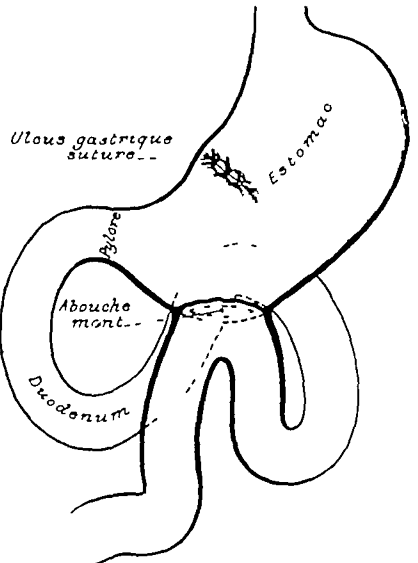


Fig 133.—Gastro-Intestinal Surgery (Gastric Ulcer treated by Balfour's Operation and Gastro-Enterostomy)

After thermo-cauterisation, the ulcer has been buried under three catgut stitches. Gastro-enterostomy has been performed at the dependent point. *This is not to be recommended* if the patient suffer markedly from hyperacidity

Ulcus gastrique suturé = Gastric ulcer sutured. *Estomac* = Stomach *Pylore* = Pylorus *Abouchement* = Anastomosis *Duodénum* = Duodenum

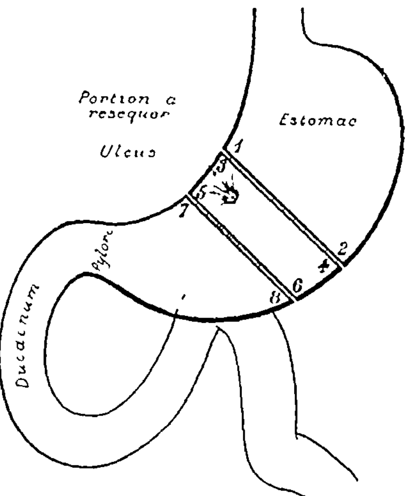


FIG 131.—GASTRO-INTESTINAL SURGERY (Resection by the Sleeve Method).

Ulcer of the small curvature of the stomach. A piece of the stomach is resected, including the ulcer Suitable to patients suffering from only slight hyperchlorhydria.

Portion à réséquer = Portion to be resected. *Estomac* = Stomach. *Ulcus* = Ulcer *Pylore* = Pylorus *Duodénum* = Duodenum.

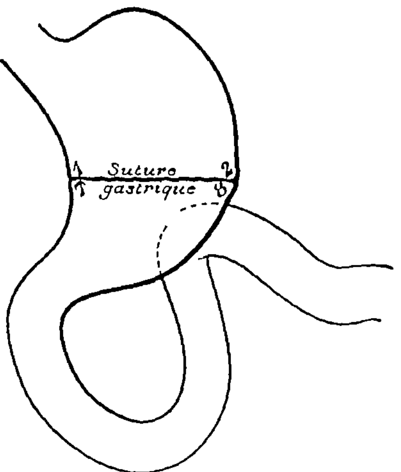


FIG 133.—GASTRO-INTESTINAL SURGERY (Annular Gastrectomy)

The two ends of the stomach are reunited to each other by end-to-end suture; this is the simplest procedure, which gives good functional results.

Suture gastrique = Gastric suture.

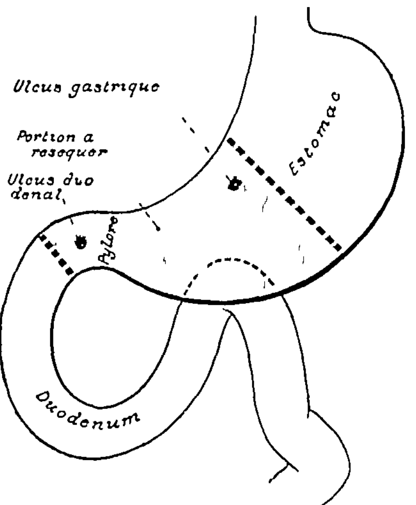


Fig 136.—Gastro-Intestinal Surgery
lastric and duodenal ulcer combined. Gastro-pylorectomy The whole part in grey is resected.

s gastrique = Gastric ulcer *Portion à réséquer* = Portion to be resected. *Estomac* = Stomach *Ulcus duodénal* = Duodenal ulcer *Pylore* = Pylorus *Duodénum* = Duodenum

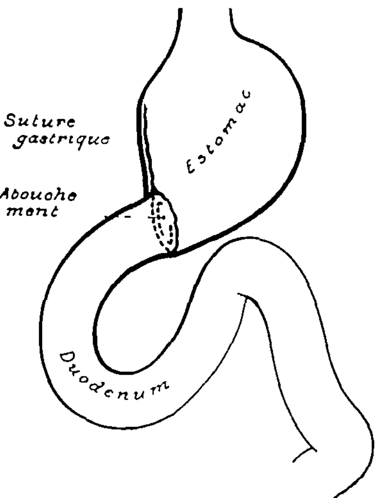


Fig 137.—Gastro-Intestinal Surgery (Péan's Method).
How to re-establish the continuity between the stomach and the duodenum after gastric resection.

Suture gastrique = Gastric suture *Abouchement* = Anastomosis *Estomac* = Stomach *Duodénum* = Duodenum

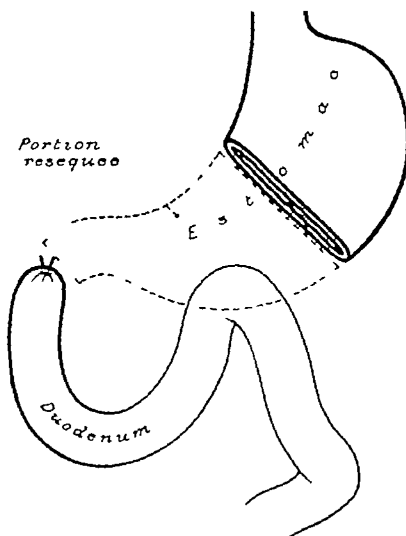


Fig 138.—Gastro-Intestinal Surgery (Billroth's Method)

Gastro-pylorectomy Resection. Closure of the duodenum in a cul-de-sac because resection has been made close to the pancreas; end-to-end anastomosis is not possible.

Portion réséquée = Resected portion. *Estomac* = Stomach. *Duodénum* = Duodenum

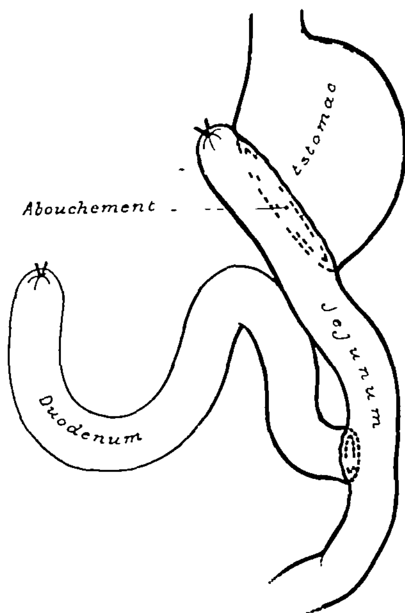


FIG. 139 —GASTRO-INTESTINAL SURGERY (Combination of Polya's and of Roux's Methods).

How to re-establish the continuity between the stomach and the duodenum. It is the best procedure implantation of the duodenal end into the jejunum, and anastomosis by gastro-jejunal implantation between the stomach and the jejunum.

Abouchement = Anastomosis *Estomac* = Stomach. *Duodénum* = Duodenum *Jéjunum* = Jejunum

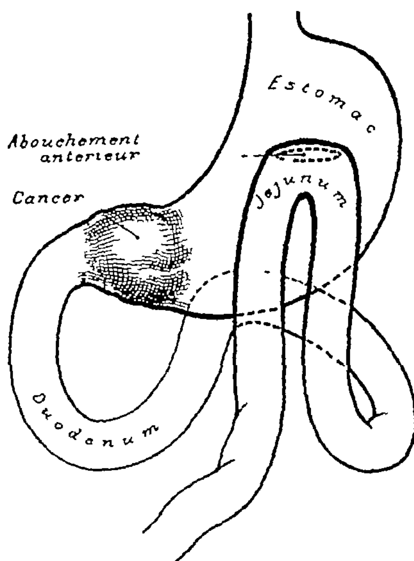


FIG 140.—GASTRO-INTESTINAL SURGERY (Gastrectomy in Two Stages)

Acute stenosis of the pylorus from cancer If the patient be cachectic, the operation should be performed in two stages, first gastro-enterostomy and secondarily gastrectomy As is seen, the former is made with a very long jejunal loop on the anterior surface of the stomach, a long distance and as far as possible from the pylorus, so as to facilitate secondary gastrectomy Jejuno-jejunostomy by a button is compulsory otherwise a vicious circle would be formed.

Abouchement antérieur=Anterior anastomosis *Estomac*=Stomach. *Cancer*=Cancer *Jéjunum*=Jejunum *Duodénum*=Duodenum

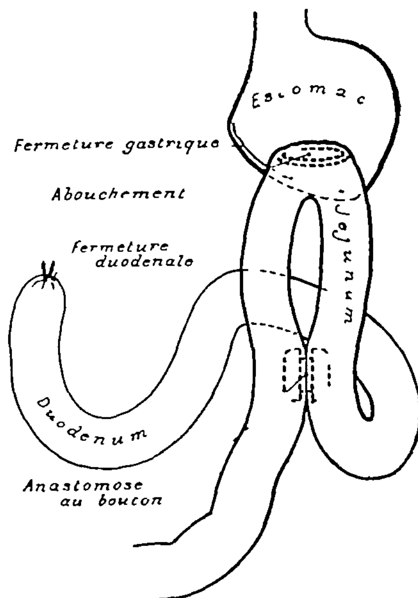


FIG 141.—GASTRO-INTESTINAL SURGERY (The Second Stage of Gastrectomy in Two Stages for Tight Cancer of the Pylorus.)

Note the gastric stump is small, but the gastro-enterostomy is at the dependent point of the gastric pocket. The stomach evacuates, therefore, very well. Jejuno-jejunostomy with a button is performed so as to prevent the regurgitation of bile into the stomach.

Estomac = Stomach *Fermeture gastrique* = Closure of stomach *Abouchement* = Anastomosis *Fermeture duodénale* = Closure of duodenum *Jéjunum* = Jejunum. *Duodénum* = Duodenum *Anastomose au bouton* = Anastomosis with a button.

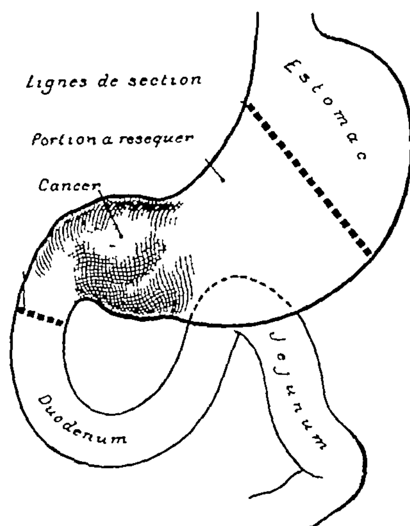


Fig 142.—Gastro-Intestinal Surgery (Gastrectomy in One Stage for Cancer of the Pylorus)

Note the extent of the resection. It ought to include nearly the whole of the lesser curvature of the stomach, and the greater part of the large tuberosity. The section is on the duodenum close to the pancreas.

Lignes de section = Lines of incision. *Estomac* = Stomach. *Portion à réséquer* = Portion to be resected. *Cancer* = Cancer. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

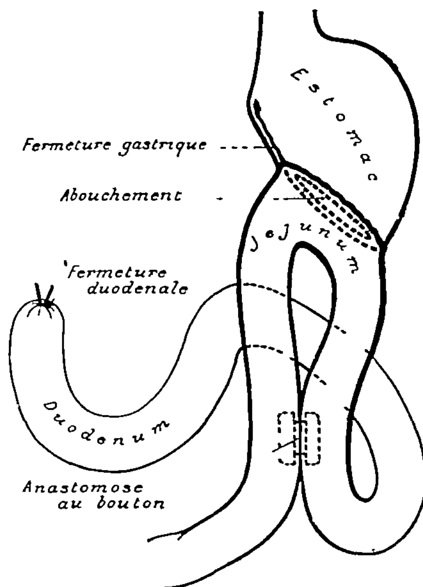


FIG 143.—GASTRO-INTESTINAL SURGERY (Gastrectomy in One Stage). The author's usual procedure

The stomach is extensively resected and partly closed, then implanted in a long jejunal loop, to avoid regurgitation of the bile jejuno-jejunostomy by Murphy's button. The duodenum is closed in a cul-de-sac.

Fermeture gastrique = Closure of the stomach. *Estomac* = Stomach. *Abouchement* = Anastomosis *Jéjunum* = Jejunum *Fermeture duodénale* = Closure of the duodenum. *Duodénum* = Duodenum *Anastomose au bouton* = Anastomosis with a button.

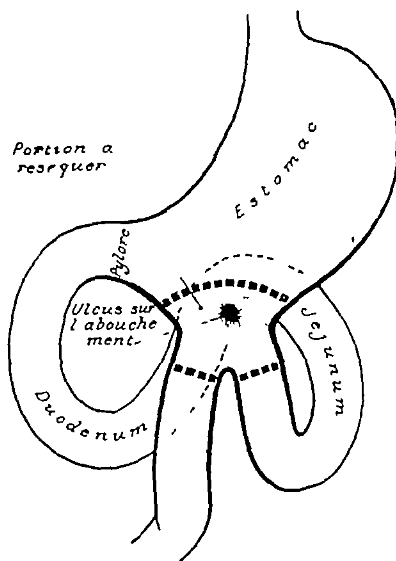


FIG. 144.—GASTRO-INTESTINAL SURGERY (Ulcer on the Anastomosis Following a Gastro-Enterostomy for Duodenal Ulcer).

The part in grey shows the portion which will be rosected. The anastomosis is resected with the ulcer

Portion à réséquer = Portion to be resected *Estomac* = Stomach *Pylore* = Pylorus *Ulcus sur l'abouchement* = Ulcer on the anastomosis *Jéjunum* = Jejunum *Duodénum* = Duodenum

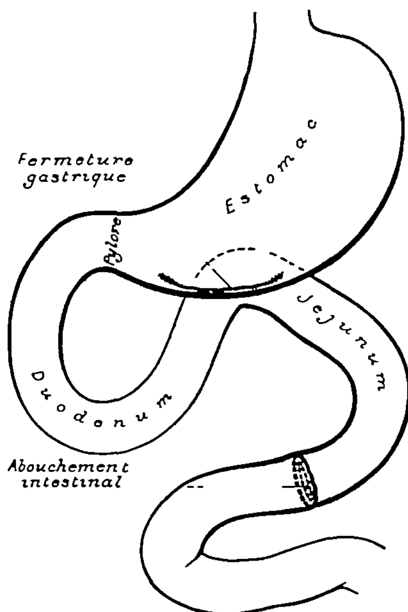


FIG 145 —GASTRO-INTESTINAL SURGERY (Jejunal Ulcer).

To cure the jejunal ulcer the anastomotic part has been removed. Note the suture of the stomach which closes it, and the end to-end anastomosis of the jejunum by which continuity is re-established.

Fermeture gastrique = Closure of the stomach *Estomac* = Stomach. *Pylore* = Pylorus *Jéjunum* = Jejunum. *Duodénum* = Duodenum *Abouchement intestinal* = Intestinal anastomosis

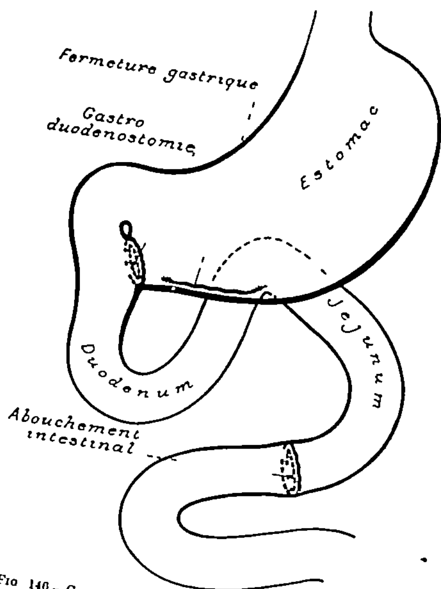


FIG 140 —GASTRO-INTESTINAL SURGERY (Jejunal Ulcer)

Gastro-duodenostomy for treatment of a jejunal ulcer It is not sufficient to remove, as in the preceding figure, the anastomosis, and to close the jejunum and the stomach separately but prevention also of the recurrence of the duodenal ulcer is required. For this reason the simplest operation has been performed, if not the easiest technically at least the best physiologically by making a gastro-duodenostomy which anastomoses the great tuberosity of the stomach with the second part of the duodenum. In this way secondary jejunal ulcer is not to be feared

Fermeture gastrique = Closure of the stomach *Estomac* = Stomach. *Gastro-duodenostomie* = Gastro-duodenostomy *Jejunum* = Jejunum *Duodenum* = Duodenum *Abouchement intestinal* = Intestinal anastomosis

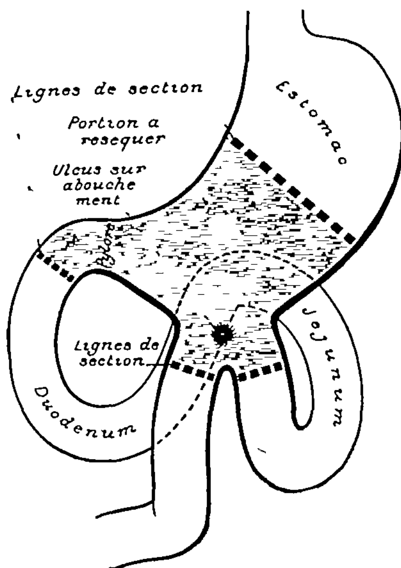


FIG 147 —GASTRO-INTESTINAL SURGERY (Jejunal Ulcer of the Anastomosis).

The ideal treatment consists in gastro-duodenostomy and re-establishment of the normal walls of the duodenum and of the stomach. Here the duodenum is too far from the stomach, which is too short, and the operation of gastro-duodenostomy would be difficult the above easier but more mutilating operation is performed.

Lignes de section = Lines of incision. *Estomac* = Stomach. *Portion à réséquer* = Portion to be resected. *Ulcus sur abouchement* = Ulcer of the anastomosis *Pylore* = Pylorus *Jéjunum* = Jejunum *Lignes de section* = Lines of section *Duodénum* = Duodenum

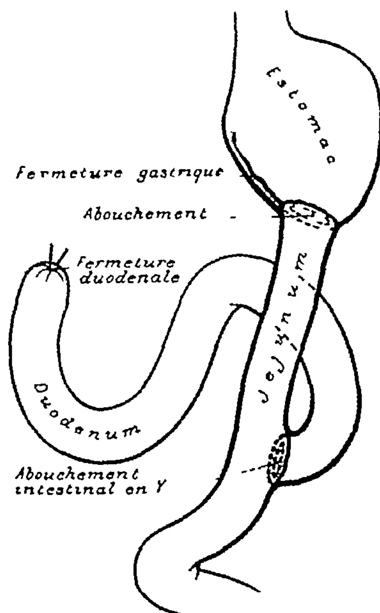


FIG. 148.—GASTRO-INTESTINAL SURGERY (Jejunal Ulcer).

How the continuity of the digestive tract is re-established after gastrectomy

Fermeture gastrique = Closure of the stomach *Estomac* = Stomach. *Abouchement* = Anastomosis *Fermeture duodenale* = Closure of the duodenum *Duodenum* = Duodenum *Jéjunum* = Jejunum *Abouchement intestinal en Y* = Intestinal anastomosis in Y

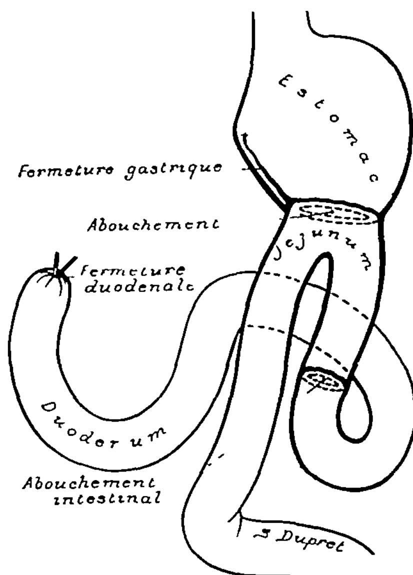


FIG 149 —GASTRO-INTESTINAL SURGERY (Jejunal Ulcer)

Another procedure to re-establish the continuity of the digestive tract, after gastrectomy when the jejunal ulcer has been cured.

Fermeture gastrique = Closure of the stomach. *Estomac* = Stomach. *Abouchement* = Anastomosis *Jéjunum* = Jejunum *Fermeture duodénale* = Closure of the duodenum. *Duodénum* = Duodenum. *Abouchement intestinal* = Intestinal anastomosis

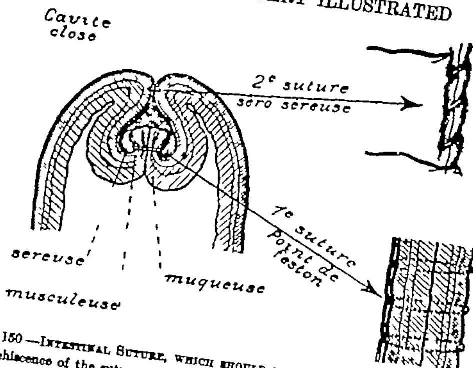


Fig 150—Intestinal Suture, which should not be Applied (Th. de Martel).
The dehiscence of the suture, and the pulmonary complications, are often due to the formation of a septic cavity between the two levels of suture.

Cavité close = Closed cavity   *2e suture séro-séreuse* = Second suture of the serous surfaces   *1e suture Point de feston* = First suture, button-hole stitch   *Muqueuse* = Mucosa   *Musculeuse* = Muscular coat   *Séreuse* = Serous coat

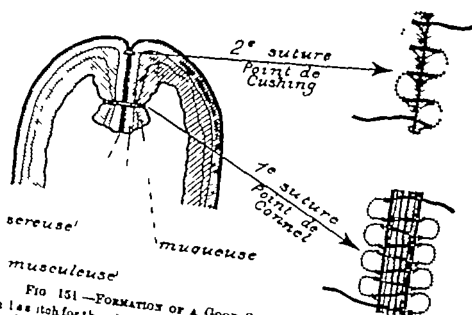


Fig 151—Formation of a Good Suture (Th. de Martel)
(a) Connell's stitch for the whole edge (b) Cushing's stitch for the serous surfaces. There is in this way no closed cavity between the levels of the suture. The mucosa pouts on the side of the digestive cavity; the two rows of suture are invisible from the serous side (*Sorén's diagram*).

2e suture, Point de Cushing = Second suture (Cushing's stitch)   *1e suture, Point de Connel* = First suture Connell's stitch   *Séreuse* = Serous coat   *Muqueuse* = Mucosa   *Musculeuse* = Muscular coat

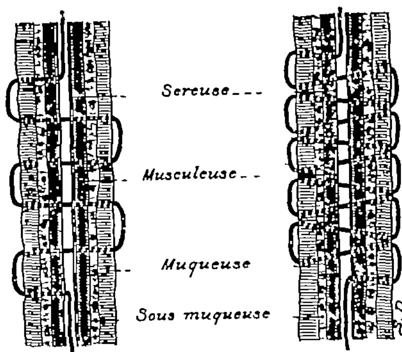


FIG 152.—GOOD THROUGH-AND-THROUGH SUTURE—WHAT SHOULD BE DONE AND WHAT AVOIDED (SORÉSI).

These two diagrams show how Connel's stitch should be made It not only assures apposition of the two serosæ, but also makes complete hæmostasis. On the left, note the sutures have a rectangular appearance, and spare the vessels. On the right, the triangular form of the stitches assures hæmostasis of the whole extent of the tissues.

Séreuse = Serous coat *Musculeuse* = Muscular coat. *Muqueuse* = Mucosa. *Sous-muqueuse* = Submucosa.

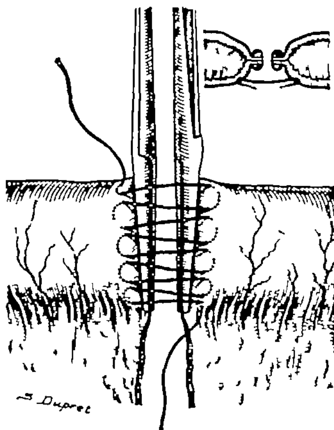


FIG 153 —ASEPTIC END-TO-END ANASTOMOSIS OF THE SMALL INTESTINE (GUDIN).

A part of the intestine has been divided between two Kocher's forceps with the thermo-cautery then Cushing's stitch has been passed. Above the diagram shows the division of the intestinal ends and the two forceps.

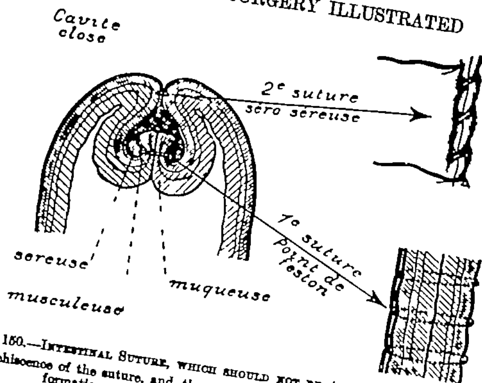


Fig 150.—Intestinal Suture, which should not be Applied (Th. de Martel).
The dehiscence of the suture, and the pulmonary complications, are often due to the formation of a septic cavity between the two levels of suture.

Cavité close = Closed cavity   *2e suture séro-séreuse* = Second suture of the serous surfaces
1e suture Point de feston = First suture, button hole stitch.   *Séreuse* = Serous coat
Muqueuse = Mucosa   *Musculeuse* = Muscular coat

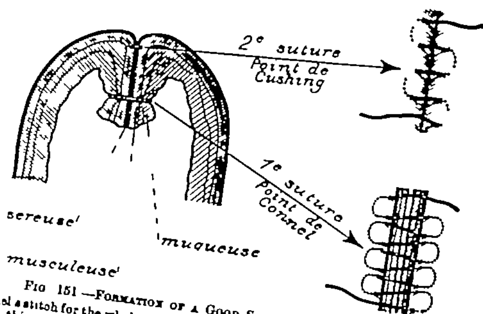


Fig 151.—Formation of a Good Suture (Th. de Martel).
(a) Connel's stitch for the whole edge (b) Cushing's stitch for the serous surfaces There is in this way no closed cavity between the levels of the suture. The mucosa pouts on the side of the digestive cavity the mucosa is not everted on to the serous coats; the two rows of suture are invisible from the serous side (*Sorin's diagram*).

2e suture, Point de Cushing = Second suture Cushing's stitch   *1e suture, Point de Connel* = First suture, Connel's stitch   *Séreuse* = Serous coat   *Muqueuse* = Mucosa   *Musculeuse* = Muscular coat

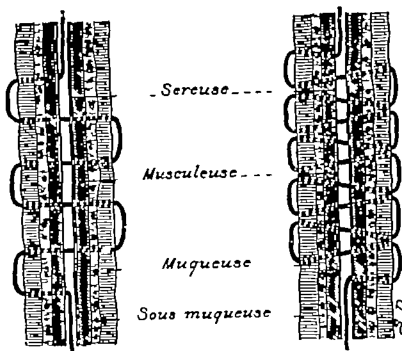


FIG 152.—GOOD THROUGH AND-THROUGH SUTURE—WHAT SHOULD BE DONE AND WHAT AVOIDED (SORÉSI).

These two diagrams show how Connel's stitch should be made it not only assures apposition of the two serosa, but also makes complete hæmostasis. On the left, note the sutures have a rectangular appearance, and spare the vessels. On the right, the triangular form of the stitches assures hæmostasis of the whole extent of the tissues.

Sereuse = Serous coat *Musculeuse* = Muscular coat *Muqueuse* = Mucosa.
Sous-muqueuse = Submucosa.

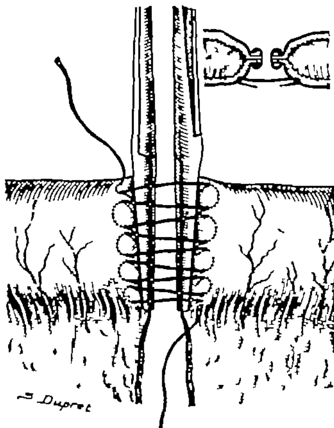


FIG 153 —ASEPTIC END-TO-END ANASTOMOSIS OF THE SMALL INTESTINE (GUDIN).

A part of the intestine has been divided between two Kocher's forceps with the thermo-cautery then Cushing's stitch has been passed. Above the diagram shows the division of the intestinal ends and the two forceps.

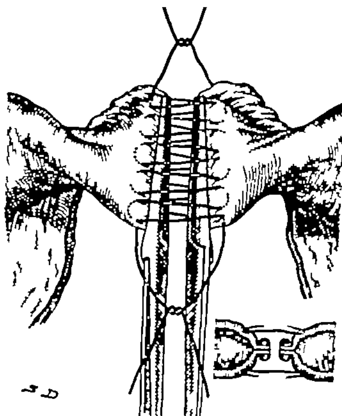


FIG 154.—ASEPTIC END-TO-END SUTURE OF THE SMALL INTESTINE (GUDIN)
The small intestine is returned. Another Cushing's stitch is made with another thread, which will be knotted with that of the opposite side.

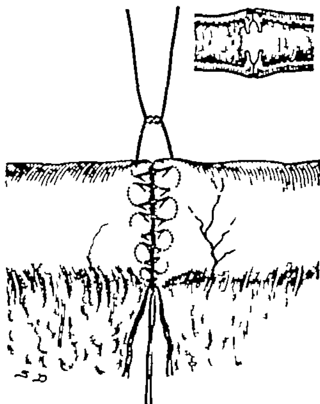


FIG 155.—END-TO-END ENTERO-ANASTOMOSIS AT ONE LEVEL (TH. DE MARTEL).
The diagram shows section of the intestine; the suture is finished. Note the edge protrudes into the interior and cannot cause any suppuration, or possible *inclusion* of a layer of mucosa between the two levels.

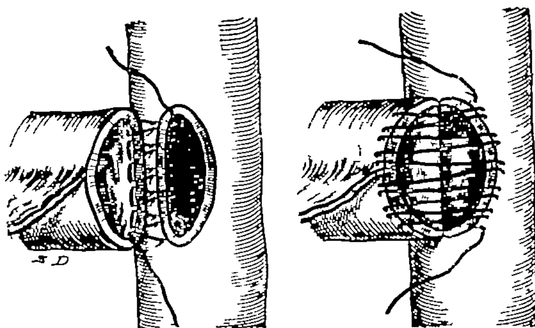


FIG 156.—JEJUNO-JEJUNAL IMPLANTATION AFTER GASTRO-ENTEROSTOMY IN Y (SORÉSI)

On the left, suture of the posterior edge on the right suture of the anterior edge Connel's stitch in V

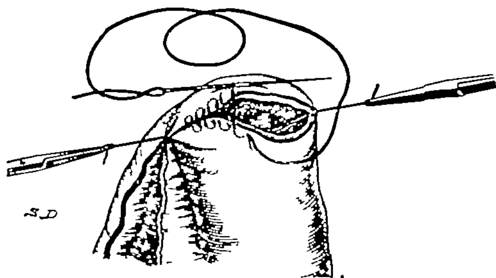


FIG. 157 —END-TO-END ANASTOMOSIS OF THE SMALL INTESTINE. (Drawing by Sorési).

The posterior through-and through suture is made. Here the anterior through and through suture (Connel's stitch), which forms the mucous layer protrudes into the intestinal cavity A single row should suffice it is preferable to make two

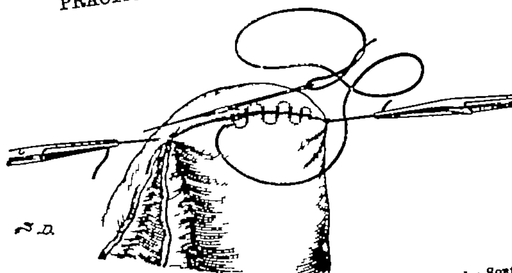


FIG. 158.—END TO-END JEJUNO-JEJUNAL ANASTOMOSIS. (Drawing by SORISI.) Cushing a stitch (serous surfaces) The deep through-and through level has already been formed.

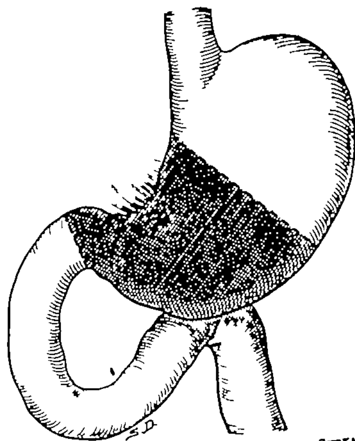


FIG 159.—PYLORO-GASTRECTOMY FOR ULCER OF THE LESSER CURVATURE (V PAUCHET
Ulcer of the lesser curvature (usual form) can be treated by thermo-cauterisation, excisio
annular resection, or by gastro-pylorectomy The last is the operation of choic
(The part in grey shows the portion of the stomach to be removed.)

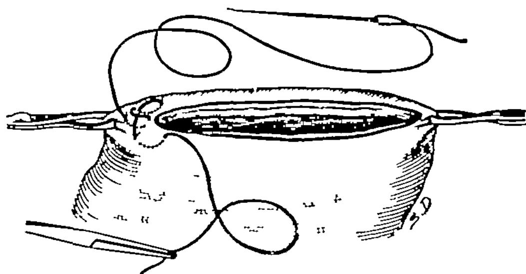


FIG 160 —COMPLETE CLOSURE OF THE STOMACH AFTER RESECTION (SOREST). Connel's stitch inverts the edge into the cavity and produces perfect hæmostasis.

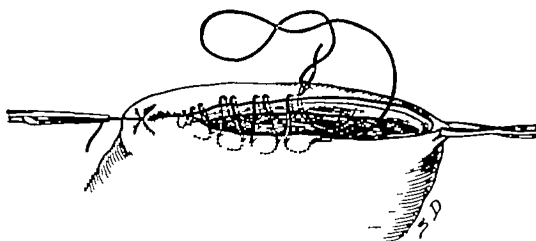


FIG 161 —COMPLETE CLOSURE OF THE STOMACH AFTER RESECTION Connel's stitches. To be sure that this suture is hæmostatic, see Fig 152.

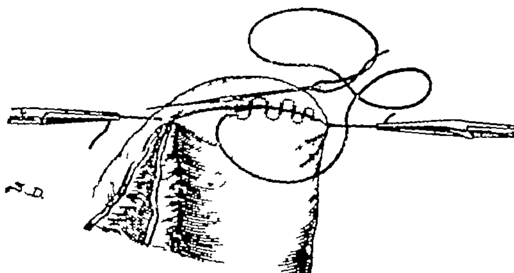


Fig 158.—End-to-End Jejuno-Jejunal Anastomosis. (Drawing by Sorel.)
Cushing's stitch (serous surfaces) The deep through and through level has already been formed.

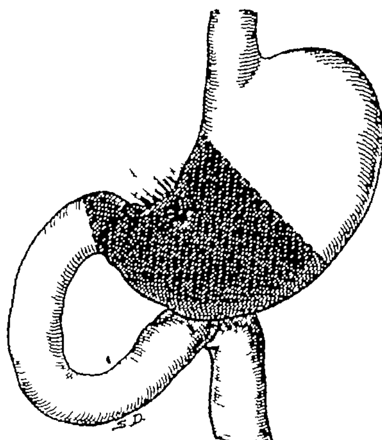


Fig 159.—Pyloro-Gastrectomy for Ulcer of the Lesser Curvature (A. Pauchet).
Ulcer of the lesser curvature (usual form) can be treated by thermo-cauterisation, excision, annular resection, or by gastro-pylorectomy The last is the operation of choice. (The part in grey shows the portion of the stomach to be removed.)

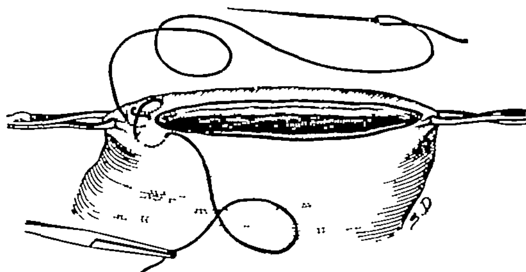


Fig 160.—Complete Closure of the Stomach after Resection (Soresi)
Connell's stitch inverts the edge into the cavity and produces perfect hæmostasis.

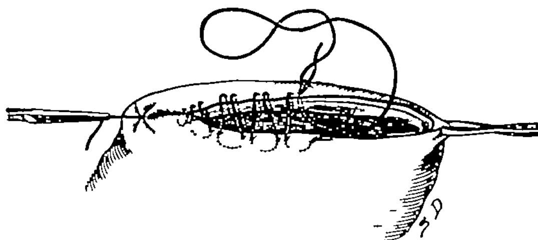


Fig 161.—Complete Closure of the Stomach after Resection
Connell's stitches. To be sure that this suture is hæmostatic, see Fig. 152.

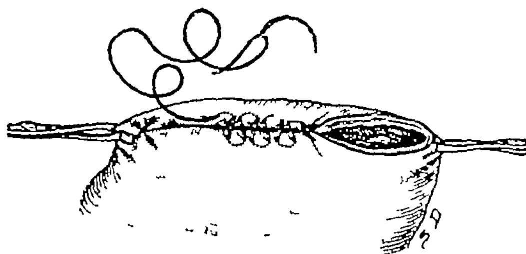


FIG 162.—THE STOMACH IS CLOSED AT ONE LEVEL WITH SLOWLY ABSORBABLE CATGUT (SORRÈL'S drawing).

The triangular form of the stitches, which allows of hæmostasis; on the upper part of the edge the suture has been tightened; the thread is invisible on the lower part; the stitches have not yet been tightened.

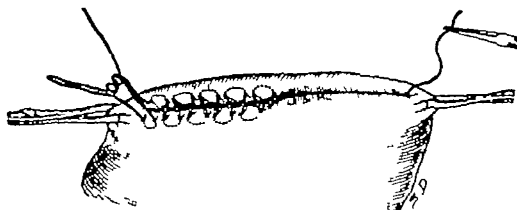


FIG 163.—INCOMPLETE CLOSURE OF THE GASTRIC CAVITY WITH SLOWLY ABSORBABLE CATGUT 00 AT A SINGLE LEVEL (SORREL'S drawing)

Closure save *for an opening of 5 centimetres, which allows of duodenal or jejunal* anastomosis; duodenal, if the duodenum be sufficiently broad and long (1 centimetre) jejunal in the contrary case. Note the triangular form of the stitches. The suture will be tightened the thread will be invisible, as on the upper half of the reunited edge.

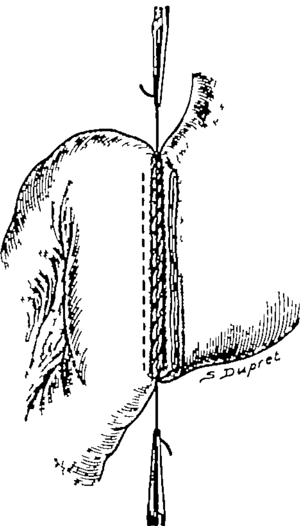


Fig. 164.—Gastrectomy and Anastomosis by Implantation (Polya).

If the gastric edge be long, it must be diminished as in the preceding figure; if it be narrow complete implantation, as here, can be made. The anastomosis commences by a posterior catgut suture of the serous surfaces The crushed stomach is not yet opened; the dotted line on the jejunum shows the part which has to be opened and anastomosed with the stomach.

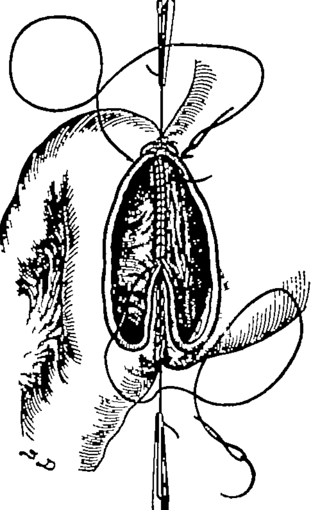


Fig 165.—Gastro-Jejunal Anastomosis by Complete Implantation (Polya)

The level of the suture on the posterior edge, beginning in the middle with two needles; the first passes a button hole stitch on the upper part of the edge and returns to the anterior margin to make Connel's stitch (through and through) which brings into apposition the two serosa. The mucosa pouts into the gastro-jejunal cavity There is no burying of the mucous edge below the serous layer When the suture has descended to the middle of the deep posterior suture, the lower needle continues the suture in the opposite direction.

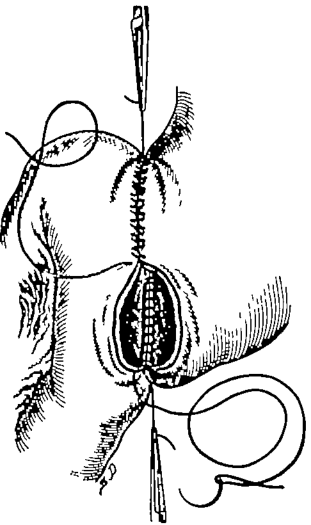


Fig. 166.—Gastro-Jejunal Anastomosis by Complete Implantation (Polya).

The upper half of posterior button hole stitches is finished, as also the upper half of the anterior through-and through suture. Note the form in V and not in U of the stitches. The suture is not yet tied, so that the thread is still visible. The lower needle has finished the reunion of the through-and through suture of the posterior edge, and will begin the anterior through-and-through suture to rejoin the suture made by the upper needle (Sorési's drawing).

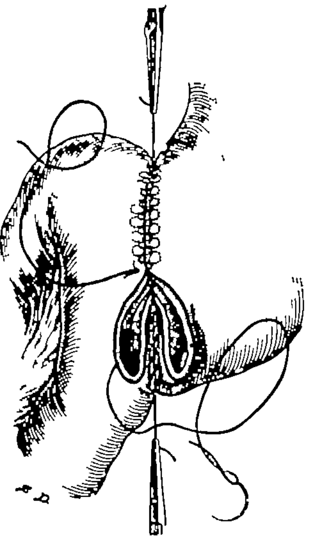


Fig 167.—Gastro-Jejunal Suture by Complete Implantation (Polya).

The upper half of the suture of the posterior edge is terminated as also the upper half of the through and through anterior suture. The suture is not tied. The lower needle which passes the inferior half of the thread begins to make the through-and-through suture of the posterior edge (button-hole stitch) (Sorési's drawing).

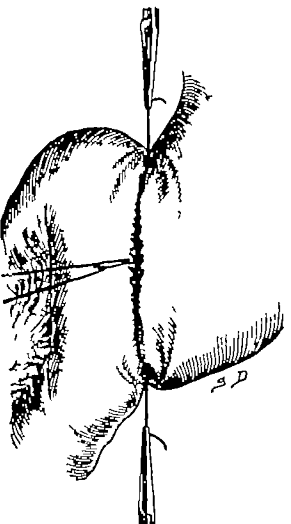


Fig 168.—Gastro-Jejunal Anastomosis by Complete Implantation (Soresi's drawing).

The suture of the anterior edge is correctly executed. The stitches are triangular and not in U in this way hæmostasis is perfect.

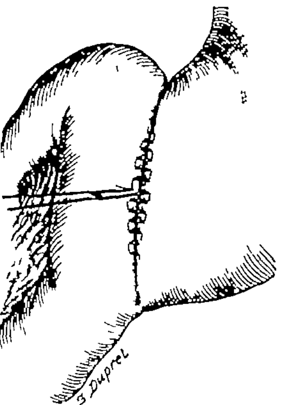


Fig 169.—Gastro-Jejunal Anastomosis by Complete Implantation (Soresi's drawing)

The two threads will be knotted and bury the through and-through suture.

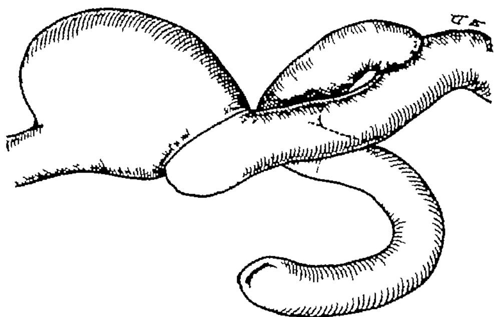


Fig 171.—Gastro-Jejunal Anastomosis by Complete Implantation (Sonder).

The whole of the short gastric edge has been implanted into the distal opening of the jejunum, enlarged by cutting with scissors. The duodenal end of the jejunum has been implanted into the preceding loop.

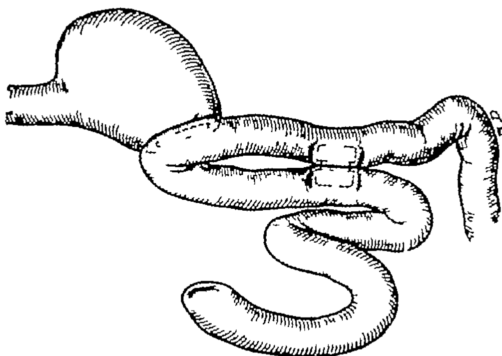


Fig 170.—Gastro-Jejunal Anastomosis by Complete Implantation (V Pauchet).

End-side implantation completed by jejuno-jejunal anastomosis with a button. This is the most convenient gastro-enterostomy after gastrectomy

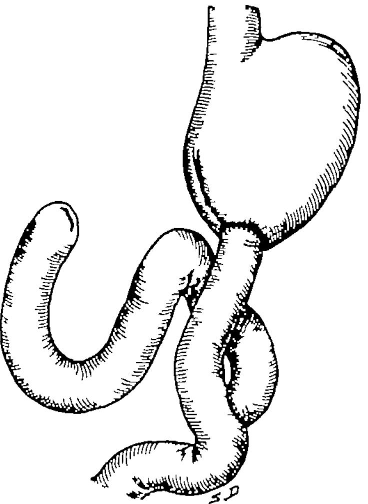


FIG 172.—GASTRO-JEJUNAL ANASTOMOSIS BY IMPLANTATION (VICTOR PAUCHET).

The operator has preserved an opening in the stomach corresponding to a quarter or a third of the gastric edge; the jejunum has been *directly anastomosed end to-end with the stomach.* Recourse should be made to this manœuvre if the gastric wall be supple and thin, and the jejunum broad. The duodenal part of the jejunum has been implanted *laterally into the distal end of the jejunum*

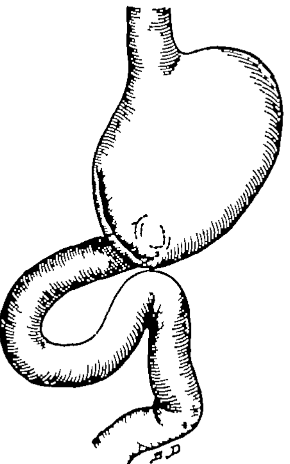


FIG 173.—GASTRO PYLORECTOMY IS FINISHED ANASTOMOSIS BY IMPLANTATION OF THE DUODENUM ON THE POSTERIOR SURFACE OF THE STOMACH (KOCHER's method).

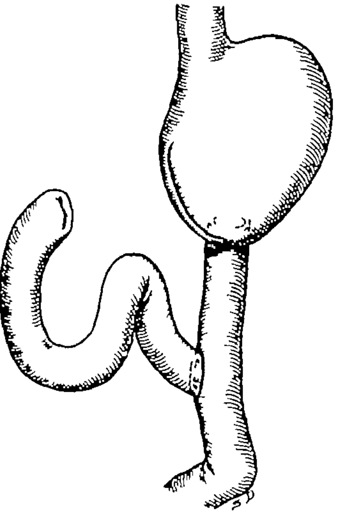


FIG 174.—POSTERIOR ANASTOMOSIS IN Y (ROUX)
The stomach being closed in a cul-de-sac, the jejunal loop has been implanted on the posterior surface of the stomach, at the most dependent point.

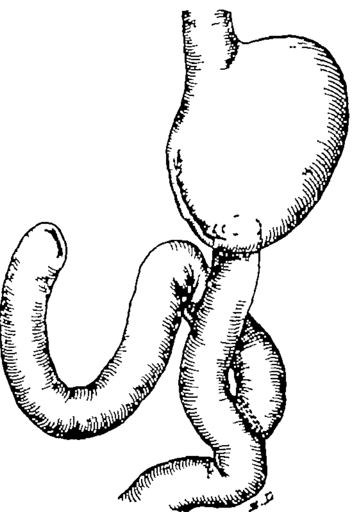


FIG 175.—ANASTOMOSIS IN Y OR C ROUX. IMPLANTATION ON THE LEFT

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VII

SURGERY OF THE LARGE INTESTINE

Different Points of Technique—Treatment of Intestinal Obstruction from Cancer of the Colon.

In all cases of abdominal surgery the choice of the time for the operation and of the procedure to be adopted plays a great part in the result

This is never better shown than in cases of obstruction from cancer of the colon No two patients present the same therapeutical indications They vary according to whether the patient be fat or thin, young or old resistant or debilitated, according to whether the symptoms be acute or chronic, the lesion be on the right, left, or on the sigmoid colon, or whether the abdomen be flat or distended. Fat or aged patients bear operations badly, distended abdomens lend themselves badly to an exploratory incision and to evisceration, owing to the difficulties met with in replacing the distended intestinal mass, or from the dangers of infection from an incision made for the purposes of emptying the bowel

Notwithstanding this extreme clinical difference, some types of cases and of therapeutical methods can be considered

The operative results, immediate and distant are generally satisfactory

(*A*) Tense, Distended Abdomen —The ideal would be to eviscerate the intestine, on condition that the colon be greatly distended and the small intestine feebly so Complete colectomy in one stage would then be perfect treatment if the patient were still strong large removal of the diseased intestine and of the glands immediate removal of the toxic and infectious intestinal discharges easy closure of a supple and flaccid abdomen with immediate relief by removal of the fæcal toxins and of the painful distension Cure in one stage in fifteen days without any further intervention, in this way we have succeeded in curing patients with the happiest results But if the cancer be situated in the cæcum or in the ascending colon the distension develops in the small intestine

the surgeon then cannot reduce the intestine, it has to be opened and emptied This evacuation increases markedly the risks of death whatever the precautions taken for protecting the peritoneum I have not drawn up statistics, but I have certainly lost the majority of cases of intestinal obstruction where I have had to make an incision to empty the bowel

If, before the operation, the clinical and X ray examination show the surgeon with certainty the cancer is situated low down (descending colon commencement of a long sigmoid), or there be a volvulus of the ileum, median laparotomy and evisceration would be efficacious But, save in the cases diagnosed as volvulus or cancer of the ileum it is better to make a right iliac incision and create a cæcal fistula (cancer of the colon) or an iliac one (cancer of the cæcum)

The patient, then, having a right iliac or a cæcal fistula, what should now be done ?

Wait four or five days and then note the following conditions

Improvement of the general health which ought to be benefited from the evacuation of the fæcal matters.

The good or bad appearance of the local condition irritation of the skin consistence of the discharges and their state of digestion, the tolerance of the skin to the fæcal discharge, and if the fistula improve the health, or, on the contrary, weaken the patient

Site of the lesion, recognisable by radioscopy a method or exploration which is however, far from being infallible for sometimes it shows obstacles which do not exist, and fails to reveal those that are present But we should regularly have recourse to it What could we do without the X rays ?

An iliac fistula should be closed as early as possible How ? By performing ileo-sigmoidostomy, after closure of the two ends of the ileum and closure of the iliac or of the cæcal fistula four or five days later

These operations are to be performed under local anæsthesia Fifteen days after the closure of the fistula a second partial or complete colectomy is to be carried out

(*B*) Obstruction with a Non Distended Abdomen —The obstruction may be acute or subacute and is recent the abdomen may be slightly distended and swollen, but not tense What is to be done in these conditions ? That depends on the site of the affection. If the site be precisely determined by X rays or by palpation cancer of the right and of the left colon must be treated

differently The first by ileo-colostomy (short-circuit), the second by colectomy in two stages But if the diagnosis has not been made, it is necessary to make an exploratory laparotomy to find out the site of the lesion The treatment differs, according to the case

In order to make a partial resection of the colon in two stages, a cæcal anus is not indispensable, but if it be made at the beginning, cure is still more simple, on condition that it is sufficiently large for the fæcal discharges to be deviated as completely as possible In these conditions, once the resection is performed, the two ends of the colon are to be fixed to the skin of the abdomen It is a good thing to remember that the re-establishment of the continuity of the colon forming the second stage is not always easy, especially if it be postponed to a distant date, the extremities of the intestine atrophy and contract, the end to-end suture often becomes loose, and a transitory stercoral fistula delays the cure for some months It is of much greater importance, at the time of the first operation to prepare for the second (anastomosis of the colon to the colon), for the technique of this last stage is more difficult, although it is a mild operation.

There are two easy methods of preparing for it—enterotomy and anastomosis by a button

Enterotomy is possible if, at the time of the first stage the two free loops of the colon are fixed together laterally by a continuous suture of the serous surfaces of 7 to 8 centimetres in length, forceps introduced into each end of the colon then closed eight days later, and left in place forty-eight hours, destroy and crush the two apposed walls and create a kind of communication the closure of the end of the lateral appositions, three weeks later, does not contract the lumen of the colon. If the two loops of the colon have not been sutured previously there is a danger of pinching an interposed loop of small intestine

The second method of preparation for the re-establishment of the colon to the colon is anastomosis by the button. The button is, generally hardly to be recommended for the large intestine, for two reasons the intestinal wall is thin and bears pressure badly, so that the surface of contact of the two parts brought into apposition by the coaptation of the two pieces of button, does not give absolute guarantee of continence nay more the lumen of the button can be stopped up by the fæcal matters These two harmful conditions may be avoided thus (a) by placing a stitch on each side of the button, and (b) the lateral apposition of the two colons being brought

about by an opening of the two extremities of the colon, the fæcal matters discharge externally without meeting any obstacle, and *without* causing pressure on the intestinal wall, so that there is no risk of filtration between the button and the intestine or of stopping up the latter When the button has come away by the natural or by the artificial anus, the external opening, the artificial anus, can then be closed, which is easy

(*C*) CANCER OF THE LEFT COLON —I do not speak of the sigmoid loop The treatment of cancer of the left colon is complete colectomy in one or two stages, or exteriorisation and resection, of which I will describe the second stage It was recommended long years since by Quénu, Hartmann etc

The tumour is freed (*we have described the technical details* in Vol. III of Practical Surgery Illustrated p 169) It ought to be liberated very far from the meso-colon so as to remove as many of the glands as possible although they are very often unaffected, especially in cancer of the left colon The two ends of the colon are brought into contact laterally and fixed to the wall Relief is experienced there is no need to make a cæcal anus, since the anus of the proximal end evacuates the contents of the colon One, two, or three months later perform a radical cure of the anus, as we have indicated above (see the drawings)

(*D*) CANCER OF THE RIGHT COLON, WITH OBSTRUCTION —What is to be done? It would seem rational to make an ileo-sigmoidos tomy If, however, the abdomen be distended and the obstruction acute, we *do not* recommend *it*, granting *that the ileo-sigmoid* ostomy performed during the acute stage runs a risk of rupturing as a result of the septic condition of the contents of the small intestine It is wiser simply to reduce the intestine into the abdominal cavity, and to make a cæcal anus, or if the abdomen be lax, an ileo-sigmoid ostomy and to deviate the contents of the bowel by means of a 22 Nélaton s catheter introduced by a punctiform opening 10 centimetres above the anastomosis It is then that operations in many stages come again into their own After the cæcal anus, and complete evacuation the operator should perform a sigmoid or transverse ileo-colostomy according to the state of the colon, more *often, the sigmoidal one is the more favourable* There is no risk, all the more as the patient has a cæcal anus At a third stage the cæcal anus should be closed and at a fourth stage partial or complete colectomy should be performed Each of these opera

tive stages is perfectly mild If we wish to avoid a cæcal anus, and if we perform ileo-sigmoidostomy, we should choose anastomosis with a button, to prevent contact of the fingers with the fæcal discharges, and, in addition, an iliac counter opening, with a 22 Nélaton catheter Puncture the ileum 10 centimetres above the anastomosis, and introduce the catheter, which removes the evacuations, fix the catheter to the peritoneum by two forceps passing out in the median line, remove it on the eighth day, it leaves no fistula

From this procedure we see cancer of the right or of the right transverse colon sometimes includes four operative stages, each of extreme mildness Cancer of the left colon generally consists of two stages, but I repeat in cases where the diagnosis is doubtful, a cæcal anus or an ileo-sigmoidostomy removing the discharges by a Nélaton s catheter, should be performed It is often, then, necessary to operate in three or four stages

(*E*) OBSTRUCTION FROM CANCER OF THE SIGMOID —If the sigmoid be long (dolicho-colon) and the cancer high up near the descending colon, treat it as a cancer of the left colon—*i.e*, by partial resection in two stages (*a*) exteriorisation and resection, (*b*) closure of the anus two months later

If the sigmoid be short, or the cancer low down, make a cæcal anus then a partial resection followed by end to-end suture, the prognosis is not so good as in cancer of the right or left colon

(*F*) WHAT IS TO BE DONE AFTER AN ATTACK OF INTESTINAL OBSTRUCTION WHICH HAS SUDDENLY PASSED OFF AND HAS BEEN FOLLOWED BY APPARENT CURE ?—Radioscopy, after a bismuth meal Radioscopy, after an opaque injection Always exploratory laparotomy If the attack pass away do not lull the patient into false security and recommend him to fatal temporisation a new attack will take place and the cancer will be progressing even if the patient s general health improve, even if the tumour be not felt or there be no pain or discharge of mucus or of blood, and even if the meal and the bismuth injection reveal no lacuna or stasis

EVERY PATIENT WHO HAS HAD AN ACUTE OR CHRONIC OBSTRUCTION, PARTIAL OR COMPLETE, LONG OR SHORT SLIGHT OR SERIOUS, OUGHT TO BE SUBJECTED TO LAPAROTOMY DURING THE QUIESCENT STAGE AS EARLY AS POSSIBLE

Recently I have seen a patient with a cæcal anus treated for acute obstruction As the discharges passed by the normal anus and as the X rays revealed neither stenosis nor tumour, the doctor

sent him to me to close the cæcal anus, I opened the abdomen and discovered a sigmoid cancer, which I resected It was only a month after the partial resection that I closed the cæcal anus

(*G*) DANGER OF LAPAROTOMY IN CASES OF OBSTRUCTION —I have noted above the disappointments an exploratory laparotomy has given me in cases of acute obstruction All surgeons are of the opinion that, in cases of distended, resistant abdomen, and the subject poisoned by stercoræmia, a button hole opening in the right *iliac region, followed by a temporary fistula*, constitutes the only method of immediate treatment

Inversely, all surgeons agree in performing an exploratory laparotomy on any patient affected with acute obstruction, when the abdomen is supple and flat, or only slightly distended

Between the two extremes, which are not the rule, there are a great number of intermediate cases where the acute obstruction is accompanied by moderate tympanitic distension. The clinician then hesitates between a cæcal anus and laparotomy, which may be simply exploratory, but also immediately curative

Each time, then, the operator hesitates, he should be content with a button hole incision in the right iliac fossa, and exploration of the cæcum, and according to the case, he should make a cæcal anus if the cæcum be distended or an iliac anus, even an ileo-sigmoidostomy by a button, if the cancer be in the cæcum or in the lower part of the right colon

To justify an exploratory laparotomy the surgeon often urges the necessity of being informed of the nature of the site, and of the relationships of the lesion Laparotomy moreover, can, in certain cases be not only exploratory but curative, because it allows of complete exeresis of the disease The surgeon *also claims* it is necessary to see if there be general peritonitis glandular or hepatic metastases adhesions of the cancerous tumour to the wall, to the ureter or to the ileum, adhesions which in his eyes should contra indicate an exeresis.

These reasons, indeed theoretically good ones are practically of no value Exploratory curative laparotomy at once in cases of acute obstruction sometimes succeeds and often fails It is only a game of chance what should direct the action of the surgeon before everything is, certainly permanent cure but there is also the *immediate* cure of the patient to be considered the desire to save the two stages of the cæcal anus is legitimate, but it is an insufficient reason, considering the advantages which a previous counter anus

permits It is better to cure a patient in three or four stages than to kill him in one It is better to have a convalescence lasting three months followed by a cure, than death in twenty-four hours

To perform laparotomy in order to know from the beginning if there be generalisation or glandular or hepatic metastases is useless Metastases are exceptional, at least at the commencement and in the usual scirrhous forms Adhesions do not contradict operation, if the tumour adhere to the small intestine the latter should be resected if the ureter be invaded it should be cut and its two ends tied, or nephrectomy performed

The adhesions are to be dissected by the knife, provided they are not cancerous, generally, they are purely inflammatory Examination for adhesions does not then justify exploratory laparotomy with the object of deciding on resection at a later date Directly the evacuation of the stercoral matters has taken place by the artificial anus, the operator will have leisure to study the patient and to make an exploratory laparotomy during quiescence, which should be at the same time curative

(*H*) WHAT METHOD OF ANÆSTHESIA SHOULD BE CHOSEN IN CASES OF OBSTRUCTION FROM CANCER OF THE COLON ?—If the site of the tumour be not discovered, and it be necessary to explore, use spinal anæsthesia When the position of the tumour is known, and when it is necessary to make an ileo-sigmoidostomy or a cæcal anus local anæsthesia suffices If there be doubt, anæsthetise the wall of each iliac fossæ and operate on the relevant side

(*I*) RECTO-SIGMOID CANCER —(*a*) Make a cæcal anus and (*b*) perform abdomino-perineal amputation, bringing down the left colon and preserving the sphincter

(*J*) CANCER OF THE RECTUM —If the patient be feeble, more than fifty years old, or if he be fat perform the perineal operation in the following way (*a*) first stage, make a left iliac anus, (*b*) second stage, perform a large perineo-sacral extirpation

If the patient be resistant—less than sixty years of age—remove the rectum in one or two stages by abdomino-perineal amputation.

(*K*) GRAVE COLITES —Make a cæcal anus At the end of some months, if the symptoms have disappeared and a rectoscopic examination be favourable if also there be no general symptoms and the discharge from the colon slight or absent close the cæcal anus If the symptoms return, open the cæcal anus again Then some months later when the inflammatory symptoms have

quietened down remove the diseased colon, following the technique indicated for cancer

The colectomy is enlarged in proportion to the lesions

(*L*) DIVERTICULITIS —Operate for the complications If there be a peri-colic abscess, incise, if a peri-colic fistula, make a cæcal anus, which often dries it up If it persist perform colectomy If there be stricture of the colon, or a pseudo-tumour make a cæcal anus, and then perform secondary colectomy In the case of cancer the procedure chosen should be based on the indications furnished by the lesion

(*M*) INFLAMMATORY CONTRACTION OF THE RECTUM —If there be a simple diaphragm, remove the contracted cylinder by the sacral route through the sphincter, bringing down the sigmoid flexure and preserving the sphincter

If there be peri rectitis and the diseased cylinder be long, perform abdomino-perineal amputation, bringing down the sigmoid colon and preserving the sphincter *In all cases, make a preliminary cæcal anus*

(*N*) MEGA COLON —With no symptoms of obstruction, perform complete colectomy in one or two stages (*a*) ileo-sigmoidostomy, below the dilated ileum, (*b*) complete colectomy If there be symptoms of obstruction treat as a volvulus.

(*O*) VOLVULUS OF THE ILEUM — Perform laparotomy and immediate resection in two stages, undo the twisted and dilated loop Suture the two most distant parts, fix the loop to the skin, resect the whole dilated part, cut the intestine close to the skin, three weeks later make an enterotomy with a clamp and then close the anus

Résumé —Try to diagnose the seat of the cancer by the X rays otherwise, make an exploratory incision on the right, in cases of distended abdomen, in the median line if the abdomen be supple.

Cancer of the cæcum.

Tense abdomen iliac anus, 15 centimetres in front of the cæcum then ileo-sigmoidostomy then right or complete colectomy

Supple abdomen ileo-colostomy then secondary colectomy

Cancer of the right colon (ascending colon, right flexure of the colon)

Tense abdomen cæcal anus then right hemicolectomy

Supple abdomen right hemicolectomy at once in one stage, or ileo-colostomy or right secondary hemicolectomy

Cancer of the transverse colon.

Cæcal anus then partial resection of the colon. End to-end suture, or ileo-sigmoidostomy then complete colectomy

Cancer of the left colon.

Tense abdomen cæcal anus and resection in two stages (four stages in all).

Supple abdomen no cæcal anus resection and exteriorisation then end to-end suture a month later or ileo-sigmoidostomy and complete colectomy a month later

Cancer of the pelvic colon.

(*a*) *Long loop* as cancer of the left colon.

(*b*) *Short loop* cæcal anus, then partial resection and bring down the loop This case gives a more serious immediate prognosis than the others To improve the prognosis in feeble subjects resect the diseased part and make a permanent iliac anus (Lockhart-Mummery and Hartmann)

N B—If, after spontaneous disappearance of the obstruction, the discharge of the fæcal matters be straightway re-established, with or without a cæcal anus, always perform an exploratory laparotomy even if the X rays indicate a normal intestinal digestion, and even if no signs or symptoms persist.

If a peri-colic abscess complicate cancer cæcal anus and incision of the abscess then exteriorisation and resection and finally closure of the intestine and of the cæcal anus

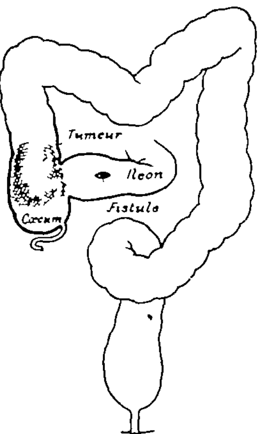


FIG. 176.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Cæcum.

FIRST STAGE.—Transitory fistula at the end of the ileum.

Tumeur—Tumour *Iléon*—Ileum *Cæcum*—Cæcum *Fistule*—Fistula.

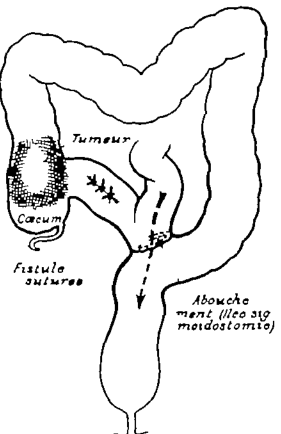


FIG 177.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Cæcum

This figure shows the second stage, ileo-sigmoidostomy and the third stage, closure of the iliac fistula. The anastomosis is made about eight days after the fistula. Closure of the fistula eight days after the entero-anastomosis.

Tumeur—Tumour *Cæcum*—Cæcum *Fistule suturée*—Fistula sutured *Abouchement (Iléo-sigmoïdostomie)*—Anastomosis (ileo-sigmoidostomy)

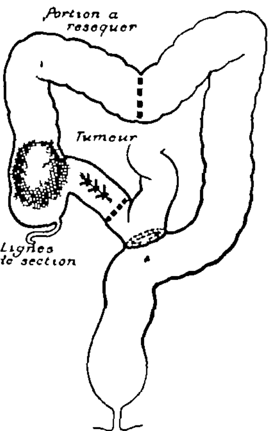


FIG 178.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Cæcum.

FOURTH STAGE.—Right hemicolectomy

Portion à réséquer = Part to be resected. *Tumeur* = Tumour *Lignes de section* = Lines of incision

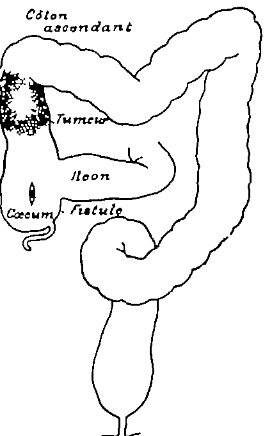


FIG 170.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Ascending Colon.

FIRST STAGE.—Cæcostomy

Côlon ascendant = Ascending colon *Tumeur* = Tumour *Iléon* = Ileum *Fistule* = Fistula. *Cæcum* = Cæcum

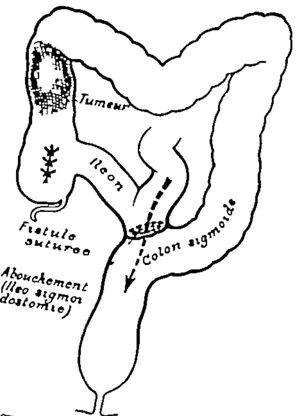


FIG. 180—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Ascending Colon.

SECOND AND THIRD STAGES.—Ileo-sigmoidostomy eight days after the cæcal fistula. Closure of the cæcostomy eight or fifteen days after the anastomosis.

Tumeur = Tumour *Iléon* = Ileum *Colon sigmoïde* = Sigmoid colon *Fistule suturée* = Fistula sutured *Abouchement (Iléo-sigmoïdostomie)* = Anastomosis (Ileo-sigmoidostomy)

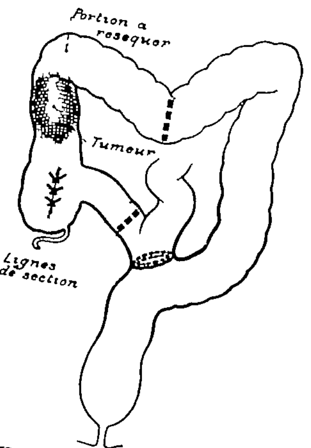


FIG 181—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Ascending Colon.

FOURTH STAGE.—Right hemicolectomy

Portion à réséquer = Part to be resected. *Tumeur* = Tumour *Lignes de section* = Lines of incision

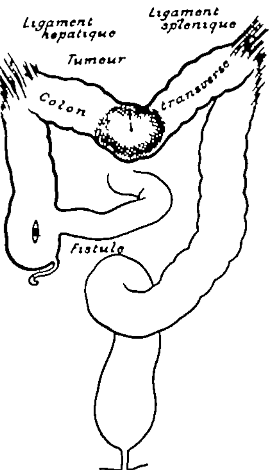


FIG 182.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Transverse Colon

FIRST STAGE.—Cæcostomy Note the splenic and hepatic ligaments, which must be divided in order to anastomose the large intestine end to-end.

Ligament hépatique = Hepatic ligament *Ligament splénique* = Splenic ligament. *Tumeur* = Tumour *Côlon transverse* = Transverse colon *Fistule* = Fistula.

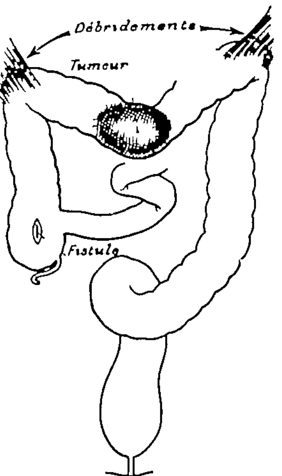


FIG 183.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Transverse Colon.

SECOND STAGE.—Resection of the large intestine. Division of the ligaments which hold the hepatic and splenic flexures in position.

Débridements = Section of the ligaments *Tumeur* = Tumour *Fistule* = Fistula.

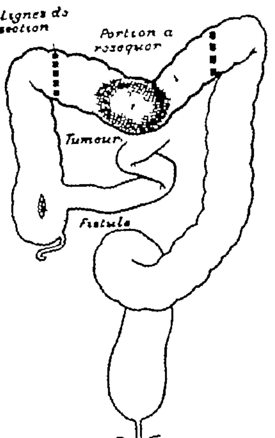


FIG 184.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Transverse Colon.

SECOND STAGE.—Resection of the large intestine.

Lignes de section = Lines of incision. *Portion à réséquer* = Part to be resected *Tumeur* = Tumour *Fistule* = Fistula.

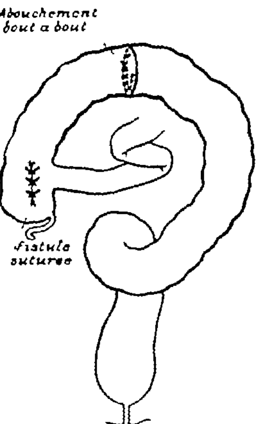


FIG 185.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Transverse Colon.

SECOND STAGE.—End to-end anastomosis of the two extremities of the transverse colon. This suture corresponds nearly to the junction of the splenic and hepatic flexures. It ought to coincide with the median line. It should be made firm by the great omentum or fixed to the median suture. The last stage—to wit, closure of the cæcostomy—is seen in this figure.

Abouchement bout à bout = End-to-end anastomosis. *Fistule*

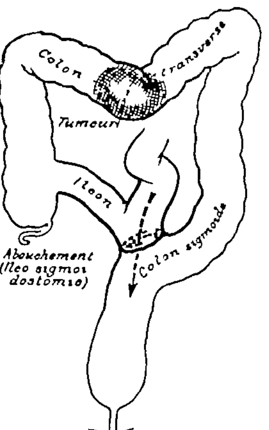


FIG 186.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Transverse Colon.

Another method. Complete colectomy in two stages.
FIRST STAGE.—Ileo-sigmoidostomy

Colon transverse = Transverse colon *Tumeur* = Tumour *Iléon* = Ileum
Colon sigmoïde = Sigmoid colon *Abouchement (Iléo-sigmoïdostomie)* = Anastomosis (Ileo-sigmoidostomy)

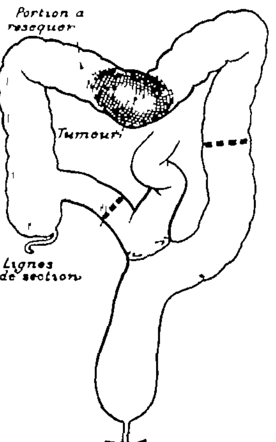


FIG 187.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Transverse Colon.

Another method. Complete colectomy in two stages.
SECOND STAGE.—About three weeks after the ileo-sigmoidostomy Resection of the colon.

Portion à réséquer = Part to be resected. *Tumeur* = Tumour
Lignes de section = Lines of division

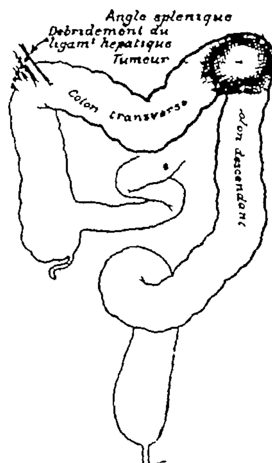


FIG. 188.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION
Cancer of the Splenic Flexure. Resection.

Resection. It is necessary to mobilise the transverse and descending colons, by dissecting the latter from the parietal layer of the peritoneum, and by freeing the transverse colon from the omentum, by cutting the hepato-colic ligament.

Angle splénique = Splenic flexure *Débridement du ligament hépatique* = Division of the hepatic ligament *Tumeur* = Tumour *Colon transverse* = Transverse colon. *Colon descendant* = Descending colon.

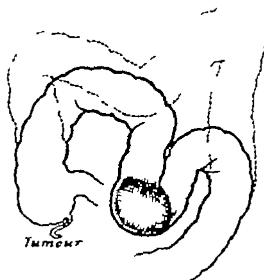


FIG 189.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION
Cancer of the Splenic Flexure.

Mobilisation of the diseased part. The operator has first freed the descending colon, the transverse colon, and the hepatic flexure he finishes by separating the splenic flexure.

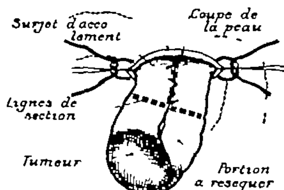


FIG 190.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION
Cancer of the Splenic Flexure.

The diseased part is forcibly drawn outside. Two healthy and distant portions are sutured together laterally by a continuous suture. The dotted line shows where the intestine will be divided, in order to fix it to the skin.

Surjet d'accolement = Apposition by continuous suture *Coupe de la peau* = Section of the skin. *Lignes de section* = Lines of division. *Tumeur* = Tumour *Portion à réséquer* = Part to be resected.

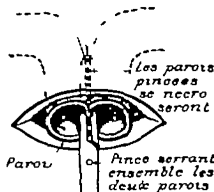


FIG 191.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION
Cancer of the Splenic Flexure.

Enterotomy This is only possible if the operator can unite laterally the two loops of the colon by a continuous suture otherwise a loop of the small intestine is rendered liable to strangulation. The forceps remain two or three days.

Les parois pincées se nécroseront = The pinched walls become necrosed. *Paroi* = Wall. *Pince serrant ensemble les deux parois* = Forceps squeezing the two walls together

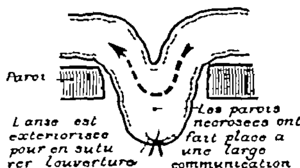


FIG. 192.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION
Cancer of the Splenic Flexure.

The result of enterotomy and of secondary closure of the anus, the latter performed fifteen days afterwards.

Paroi = Wall *Les parois nécrosées ont fait place à une large communication* = The necrosed walls have given place to a large communication. *L anse est extériorisée pour en suturer l'ouverture* = The loop is exteriorised to suture its opening

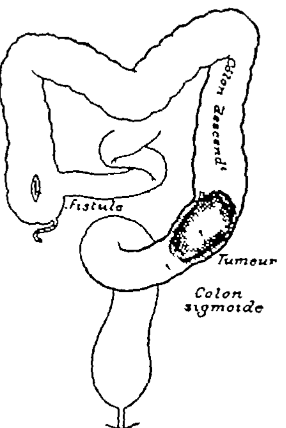


FIG. 103.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION.

Cancer of the Iliac Colon.

Here the treatment varies, according to whether the loop is short or long. If the loop be long, it is treated as a cancer of the splenic flexure or of the descending colon; exteriorisation and resection, enterotomy etc.

Côlon descendt. = Descending colon. *Fistule* = Fistula. *Tumeur* = Tumour. *Côlon sigmoïde* = Sigmoid colon.

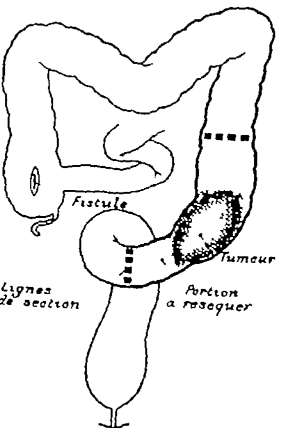


FIG. 104.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Iliac Colon.

Extensive resection of the diseased part. It is necessary to separate the splenic flexure in order to lower the transverse colon and bring it into contact with the sigmoid.

Fistule = Fistula. *Tumeur* = Tumour. *Portion à réséquer* = Portion to be resected. *Lignes de section* = Lines of division.

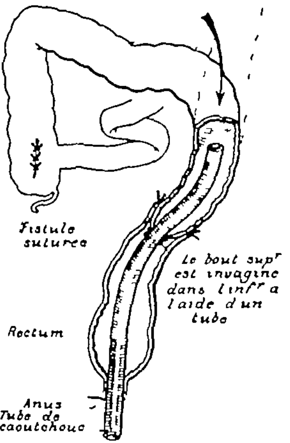


FIG 105 —CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Iliac Colon.

The establishment of the continuity of the colon. Note the mobilisation of the splenic flexure, following separation of the phrenico-colic ligament. Invagination of the upper into the lower end. The last stage (closure of the cæcostomy) is also indicated in this figure.

Fistule suturée = Fistula sutured. *Le bout supr est invaginé dans l'infr à l'aide d'un tube* = The upper end is invaginated into the lower by a tube *Rectum* = Rectum *Anus* = Anus *Tube de caoutchouc* = Rubber tube

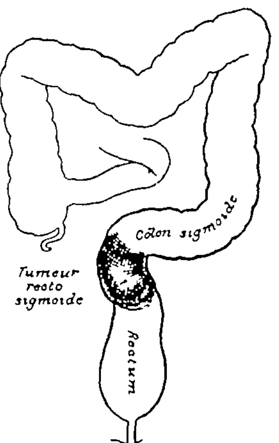


FIG 106 —CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Tumour of the End of the Sigmoid.

It should be treated as a cancer situated high up in the rectum—i e by abdomino perineal excresis.

Côlon sigmoïde = Sigmoid colon tumour *Tumeur recto-sigmoïde* = Recto-sigmoid *Rectum* = Rectum

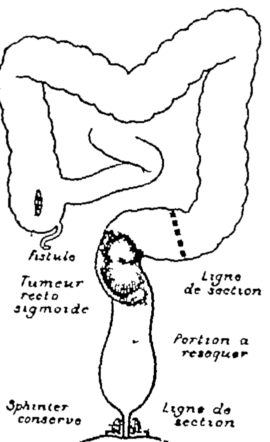


FIG. 107.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Tumour of the End of the Sigmoid.

The part of the intestine to be removed in cancer of the rectum and of the sigmoid colon. Abdomino-perineal amputation.

Fistule = Fistula. *Ligne de section* = Line of division *Tumeur recto-sigmoïde* = Recto-sigmoid tumour *Portion à réséquer* = Part to be resected *Sphincter conservé* = Sphincter preserved.

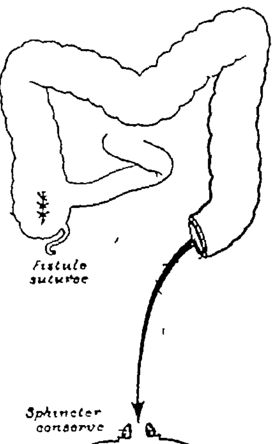


FIG. 108.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Tumour of the End of the Sigmoid.

The rectum and half of the sigmoid are removed. The end of the descending colon will be lowered after division of the left colic ligament. The fæcal fistula made before the radical operation, and closed a month after abdomino-perineal exeresis, is seen. In feeble subjects make a left terminal iliac anus (Lockhart Mummery and Hartmann).

Fistule suturée = Fistula sutured. *Sphincter conservé* = Sphincter preserved

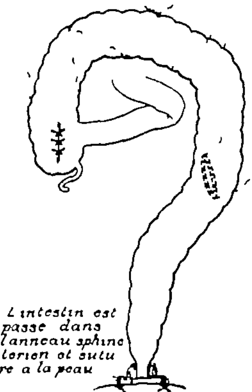


FIG 199.—CANCER OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Tumour of the End of the Sigmoid.

Appearance of the intestine before and after it has been brought down. The sphincter is preserved. Lowering the intestine increases the chances of death after the operation.

L'intestin est passé dans l'anneau sphinctérien et suturé à la peau = The intestine is passed into the ring of the sphincter and sutured to the skin

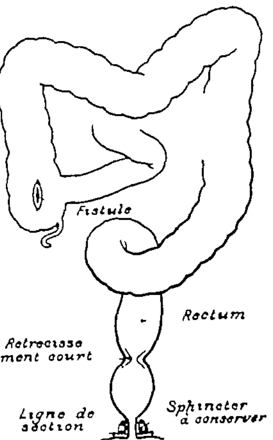


FIG 200.—LESIONS OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Diaphragmatic Stricture of the Rectum.

FIRST STAGE.—Cæcal fistula. The removal of the rectum is to be made in two stages, preserving the sphincter and only by the perineal route.

Fistule = Fistula. *Rectum* = Rectum *Rétrécissement court* = Short stricture *Ligne de section* = Line of division *Sphincter à conserver* = Sphincter to be preserved

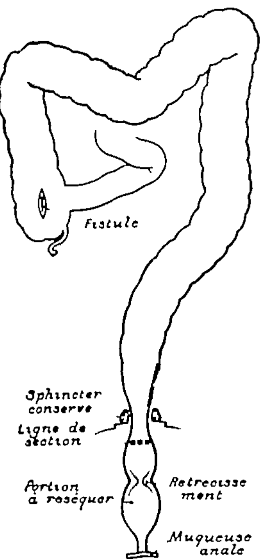


FIG. 201.—LESIONS OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Diaphragmatic Stricture of the Rectum.

Lowering the contracted rectum with removal of the whole anal muscle, preserving the sphincter

Fistule = Fistula. *Sphincter conservé* = Sphincter preserved. *Ligne de section* = Line of division *Portion à réséquer* = Part to be resected *Rétrécissement* = Stricture *Muqueuse anale* = Anal mucosa

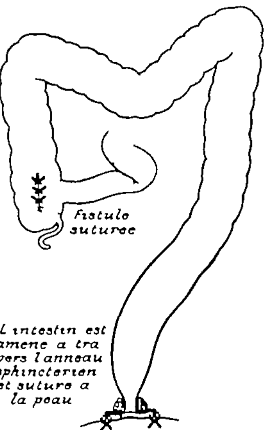


FIG. 202.—LESIONS OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Diaphragmatic Stricture of the Rectum.

Appearance of the intestine after removal of the contracted rectum; the sphincter is preserved the cæcal fistula is closed three weeks or a month after cicatrisation of the anus.

Fistule suturée = Fistula sutured *Sphincter conservé* = Sphincter preserved *Intestin suturé à la peau* = Intestine sutured to the skin

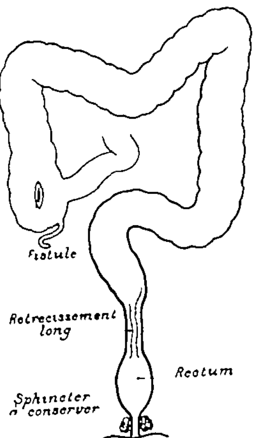


FIG 203.—LESIONS OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Extensive Stricture of the Rectum.

FIRST STAGE.—Cæcal fistula.

Fistule=Fistula. *Rétrécissement long*=Long stricture *Rectum*=Rectum *Sphincter à conserver*=Sphincter to be preserved

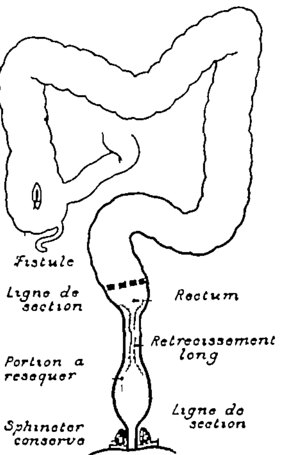


FIG 204.—LESIONS OF THE LARGE INTESTINE, WITH ACUTE OR CHRONIC OBSTRUCTION

Extensive Stricture of the Rectum.

SECOND STAGE.—Abdomino-perineal amputation fifteen days after the creation of the cæcal fistula.

Fistula=Fistula *Ligne de section*=Line of division *Rectum*=Rectum *Rétrécissement long*=Long stricture *Portion à réséquer*=Portion to be resected *Sphincter conservé*=Sphincter preserved.

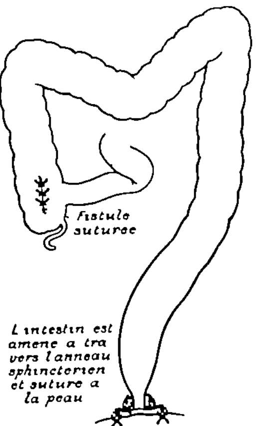


Fig 205.—Lesions of the Large Intestine with Acute or Chronic Obstruction

Extensive Stricture of the Rectum.

The operation is finished after removal of the recto-sigmoidal segment; the sigmoid is lowered to the anus, with preservation of the sphincter The cæcum is closed three weeks or a month after cicatrisation of the anus.

Fistule suturée—Fistula sutured *L intestin est amené à travers l'anneau sphinctérien et suturé à la peau*—The intestine i brought through the ring of the phincter and utured to the skin

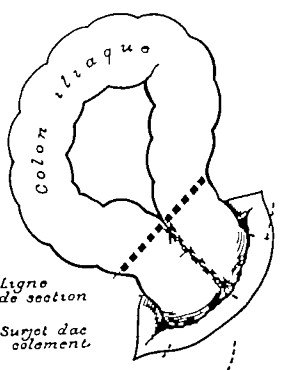


Fig 206.—Lesions of the Large Intestine with Acute or Chronic Obstruction

Resection in Two Stages of the Iliac Colon

(Cancer volvulus, dolicho-colon, mega-colon, etc.).

First Stage.—The dilated or diseased loop is drawn outside, and fixed laterally by a continuous suture and divided close to the skin.

Côlon iliaque—Iliac colon. *Ligne de section*—Line of division *Surjet d'accolement*—Apposition by continuous suture.

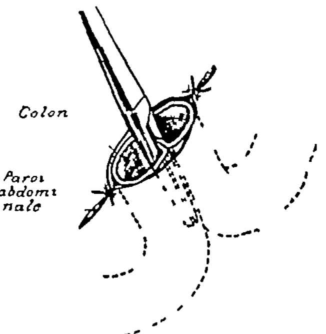


Fig 207.—Lesions of the Large Intestine with Acute or Chronic Obstruction

Resection in Two Stages of the Iliac Colon.

Second Stage.—Enterotomy is performed eight days after the preceding stage. A clamp remains *in situ* for about forty eight hours, and is tightened a little morning and evening

Colon = Colon   *Paroi abdominale* = Abdominal wall

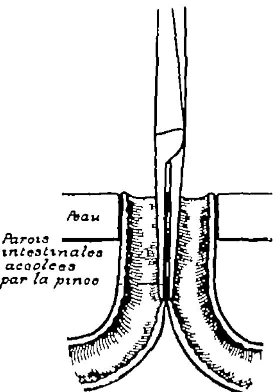


Fig 208.—Lesions of the Large Intestine with Acute or Chronic Obstruction

Resection in Two Stages of the Iliac Colon.

Second Stage.—Situation of the forceps during enterotomy The loops must be sutured, otherwise a loop of the small intestine may be included between the two segments.

Peau = Skin   *Parois intestinales accolées par la pince* = Intestinal walls brought together by forceps

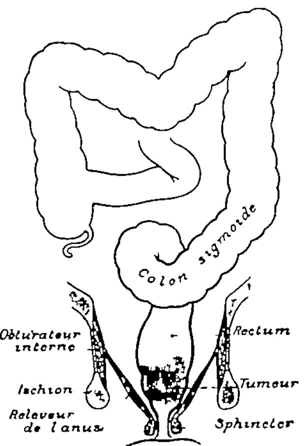


FIG 209 —LESIONS OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Rectum.

It should be treated by perineal or abdomino-perineal removal. The present case can be treated simply by the perineal route (patient feebly resistant or aged).

Côlon sigmoïde = Sigmoid colon. *Obturateur interne* = Obturator internus. *Rectum* = Rectum *Ischion* = Ischium. *Tumeur* = Tumour *Releveur de l'anus* = Levator ani. *Sphincter* = Sphincter

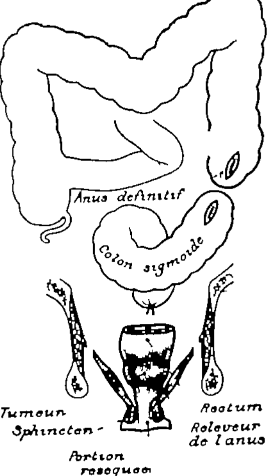


FIG 210 —LESIONS OF THE LARGE INTESTINE WITH ACUTE OR CHRONIC OBSTRUCTION

Cancer of the Rectum.

Diagram of perineal resection. In the centre, the resected portion, and above, appearance of the intestine after the removal. The sigmoid colon remains partly closed in a cul de-sac below The excretions are discharged by the upper end. The descending colon ends in a permanent anus.

Anus définitif = Permanent anus *Côlon sigmoïde* = Sigmoid colon. *T meur* = Tumour *Rectum* = Rectum *Sphincter* = Sphincter *Releveur de anus* = Levator ani. *Portion réséqué* = Resected part

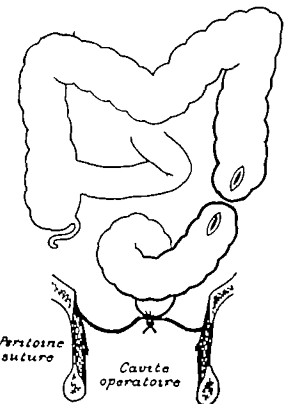


Fig 211.—Lesions of the Large Intestine with Acute or Chronic Obstruction
Cancer of the Rectum.

Appearance of the alimentary tube when perineal exeresis is ended. The lower cul-de-sac of the sigmoid is fixed to the perineal suture.

Péritoine suturé = Peritoneum sutured   *Cavité opératoire* = Operation cavity

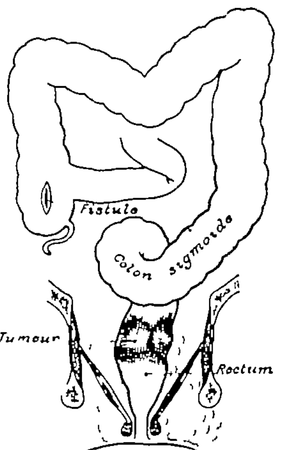


Fig 212.—Lesions of the Large Intestine with Acute or Chronic Obstruction
Cancer of the Rectal Ampulla.

First Stage.—Cæcal fistula.

Fistule = Fistula.   *Côlon sigmoïde* = Sigmoid colon.   *Tumeur* = Tumour
Rectum = Rectum

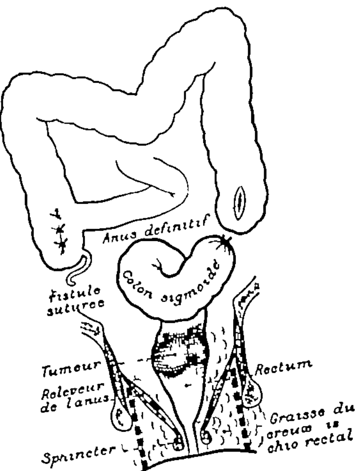


Fig. 213.—Lesions of the Large Intestine with Acute or Chronic Obstruction

Cancer of the Rectal Ampulla.

Abdomino-perineal resection of the rectum, with removal of all the soft parts of the perinæum and clearance of the pelvis. Permanent left iliac anus. The cæcal anus is closed about three weeks after abdomino-perineal exeresis, directly the patient's general condition is good.

Anus définitif = Permanent anus. *Fistule suturée* = Fistula sutured. *Colon sigmoïde* = Sigmoid colon. *Tumeur* = Tumour. *Releveur de l'anus* = Levator ani. *Rectum* = Rectum. *Sphincter* = Sphincter. *Graisse du creux ischio-rectal* = F t of the ischio-rectal fossa. *Portion réséquée* = Part resected.

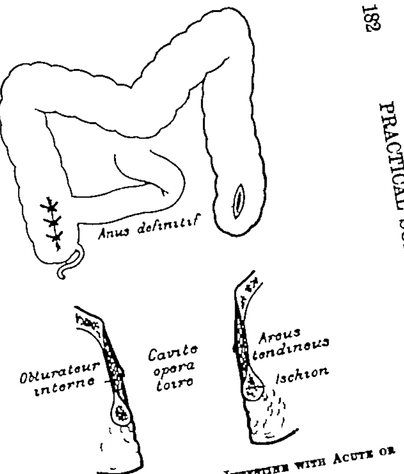


Fig 214 —Lesions of the Large Intestine with Acute or Chronic Obstruction

Cancer of the Rectal Ampulla.

Appearance of the abdominal and pelvic organs when exeresis is finished.

Anus définitif = Permanent anus. *Obturateur interne* = Obturator internus. *Cavité opératoire* = Operation cavity. *Ischion* = Ischium. *Arcus tendineus* = Arcus tendineus.

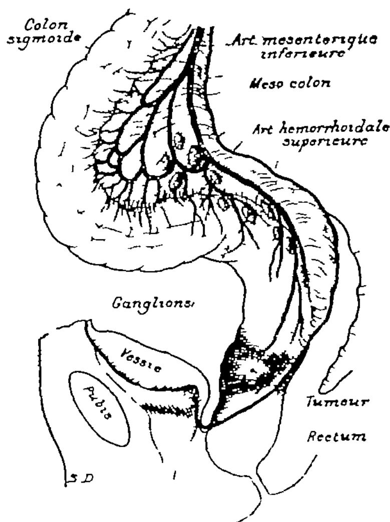
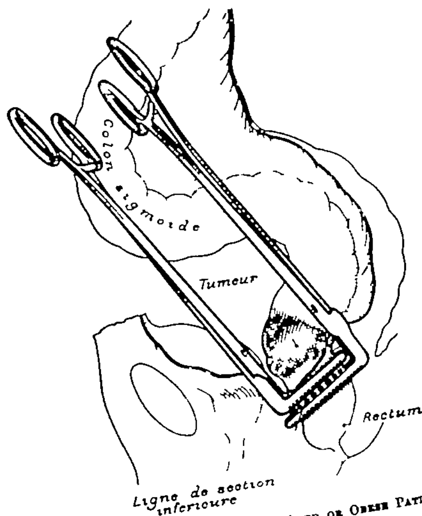


FIG 215.—INFERIOR SIGMOIDAL CANCER IN AN AGED SUBJECT RESECTION WITHOUT END-TO-END ANASTOMOSIS.

Note the situation of the inferior mesenteric artery and of the glands. Two or three centimetres of healthy tissue exist between the tumour and the pouch of Douglas.

Côlon sigmoïde = Sigmoid colon. *Art. mésentérique inférieure* = Inferior mesenteric artery *Méso-côlon* = Meso-colon. *Art hémorrhoïdale supérieure* = Superior hæmorrhoidal artery *Ganglions* = Glands *Vessie* = Bladder *Tumeur* = Tumour *Pubis* = Pubis *Rectum* = Rectum



io 216.—LOWER SIGMOIDAL CANCER IN AN AGED OR OBESE PATIENT RESECTION WITHOUT END-TO-END ANASTOMOSIS.

The division of the peritoneum has been made on the lateral and anterior parts of the rectum. Separation is carried out for some centimetres, so as to have about 5 centimetres of healthy tissue between the tumour and the divided part of the intestine. Bent forceps allow of division of the intestine without infection of the abdominal wound; the division is made by the thermo-cautery. Th. de Martel's écraseur is very useful here.

Colon sigmoïde = Sigmoid colon *Tumeur* = Tumour *Ligne de section inférieure* = Line of lower division. *Rectum* = Rectum

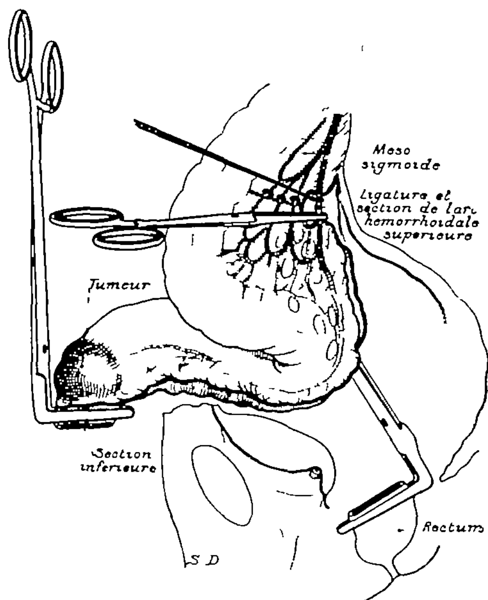


FIG 217 —INFERIOR SIGMOIDAL CANCER IN AN AGED OR OBESE PATIENT RESECTION WITHOUT END-TO-END ANASTOMOSIS.

After division of the intestine the latter is brought from above downwards the mesentery is entirely removed. Ligature of the inferior mesenteric artery

Méso-sigmoïde = Meso-sigmoid. *Ligature et section de l'art. hémorrhoïdale supérieure* = Ligature and division of the superior hæmorrhoidal artery *Tumeur* = Tumour *Section inférieure* = Inferior division *Rectum* = Rectum

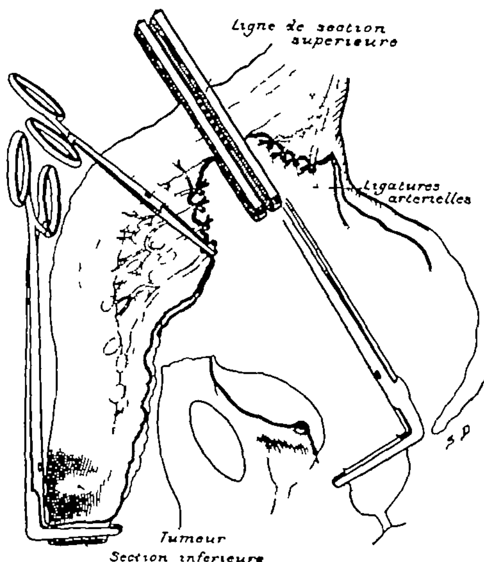


FIG 218.—LOWER SIGMOIDAL CANCER IN AN AGED OR OBESE PATIENT RESECTION WITHOUT END-TO-END ANASTOMOSIS.

The upper end will be fixed to the wall (artificial anus) The lower end is held by bent forceps, which will be removed after cauterisation and painting with iodine. The terminal branch of the inferior mesenteric is cut. The intestine will be divided above between two écraseurs of Th. de Martel.

Ligne de section supérieure = Line of superior division. *Ligatures artérielles* = Ligature of the arteries. *Tumeur* = Tumour *Section inférieure* = Inferior division.

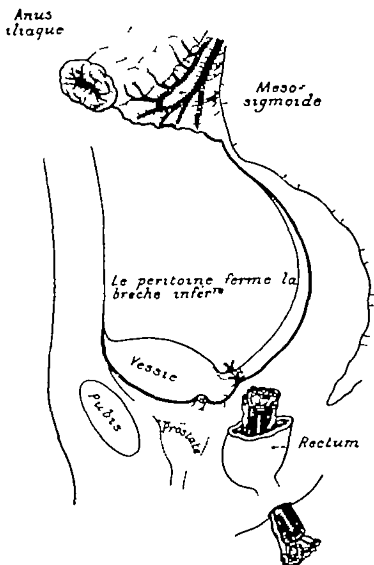


FIG 219—LOWER SIGMOIDAL CANCER IN AN AGED OR OBESE PATIENT RESECTION WITHOUT END-TO-END ANASTOMOSIS.

The operation is finished the peritoneum is fixed to the bladder When possible it is better to bring down the great omentum and to fix it by a series of interrupted sutures so as to partition off the pelvis. The terminal end of the rectum is packed with gauze and a tube inserted, after having been carefully washed with ether and painted with iodine.

Anus iliaque = Iliac anus. *Méso-sigmoïde* = Meso-sigmoid. *Le péritoine ferme la brèche inférre.* = The peritoneum closes the inferior opening *Vessie* = Bladder *Pubis* = Pubis *Prostate* = Prostate *Rectum* = Rectum

VIII

PARTIAL COLECTOMY IN TWO STAGES

Closure of an Artificial Anus —An artificial anus of surgical origin is the result of one of the following operations

(a) Cæcostomy

(b) Lateral colostomy

(c) Terminal anus formed by apposition of the two ends of the colon, side by side, after partial resection of a cancer of the colon in two stages

The closure of the lateral ani, and especially of a cæcal anus, which correspond to (a) and (b) is simple liberation of the adherent colon, closure of the opening by a suture to the serous surfaces at two levels, suture of the abdominal wall at one level. This easy operation finds no place with terminal ani (c) The two ends of the colon are parallel, side by side, and adherent To re-establish continuity of the colon, the intestinal ends must be freed, regularised, adapted, and sutured but the terminal end is often reduced in size and its walls friable One of the two parts may be brought down with difficulty because it is contracted. Marked traction on the suture will result, this danger must be avoided

But end to-end colorrhaphy is quite simple, according to the method we will indicate

(a) *Preparation of the Field of Operation* —The operator introduces a gauze drain into each end of the intestine, rubs the adjoining skin with ether and then paints it with tincture of iodine

(b) *Cutaneous Incision* —Oval incision 1 or 2 centimetres from the anus A ring of skin is thus removed in order to operate on healthy and non infected skin As soon as the cutaneous ring is freed, two tissue forceps seize its borders and bring them together so as to obliterate as by a valve, the two openings of the anus

(c) *Incision of the Aponeurosis and of the Peritoneum* —With a cut with the knife the operator opens the peritoneum, cutting in one level the aponeurosis the muscles etc Directly the peritoneum is opened he gets rid of the knife and takes the scissors, and intro-

duces the point into the abdominal cavity He incises the abdominal wall circularly close to the intestine so as to separate the latter well

(*d*) *Exteriorisation of the Intestine* —Some compresses are placed around the wound, and fixed to it by forceps, because the skin con taminated for a long time ought to be isolated. The operator carefully frees the intestine, brushing it with a tampon on forceps He removes some omental filaments and the adhesions He works without roughness, so as not to tear the intestine, which is always fragile, finally he brings outside 10 or 12 centimetres of intestine if possible, in order to perform end to-end colorrhaphy

(*e*) *Toilet of the Ends of the Intestines* —The operator divides with scissors the extremity of each anus, so as to remove the skin and the tissues of the cicatrix and to present two normal, supple intestinal ends If one of the extremities be too narrow, he enlarges it with a cut of the scissors on the convex border

(*f*) *Introduction of Two or Three Fixation Stitches* —The two ends of the colon are placed end to end and fixed by two threads *or by two Châput s forceps*

(*g*) *Through-and Through Posterior Suture* —The operator makes a button hole stitch on the posterior lips of the margins of the intestine The two anterior lips are united by Connel s stitch

(*h*) *Suture of the Serous Surfaces* —Two fixation stitches are passed one at the meso-colon, and the other at the free border of the intestine These two stitches stretch the suture, between them a *continuous suture of the serous surfaces by Cushing s method is* introduced

The sutured intestine is washed with ether and returned into the abdomen

The abdominal wound is closed at one level by Crino because the operator is never certain of absolute asepsis of the skin during such an operation The use of silk or of catgut for the different levels is not to be recommended

N B —This end to-end suture is very difficult when one end of the colon is contracted and atrophied Every preliminary opera tion which will avoid end to-end suture, is of service to the surgeon This end is obtained by two means enterotomy and side-side *anastomosis with a button* Enterotomy is only possible if at the time of the first operation which has fixed the two ends of the colon side by side to the skin the operator has sutured them by a continuous suture for 8 to 10 centimetres, otherwise the two limbs separate and at the time of crushing by forceps a loop of the ileum

may be included with the two parts of the colon The button can be applied without danger as follows the two loops of the colon, the ends of which are to be fixed to the wall, are rejoined laterally to each other, and anastomosed by a button, which is discharged by the natural or artificial anus three or four days later Should recourse be had to enterotomy and to anastomosis with the button, the task of the surgeon is much facilitated at the time of this last operation If the patient has a cæcal anus above the lateral anus, its closure should be delayed until this latter anus is closed and healed

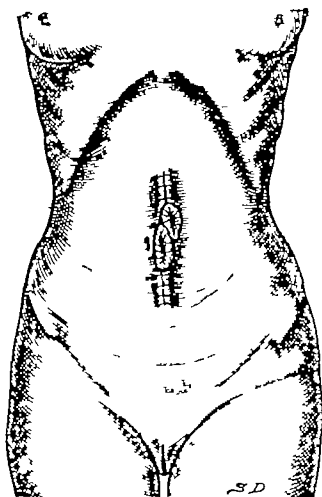


FIG 220.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS).

SECOND STAGE (Cancer of the Left Colon).—In a first stage the diseased loop has been resected with the meso-colon. The two ends fixed to the skin. The upper extremity is the end of the transverse colon the lower opening that of the descending colon, near the sigmoid.

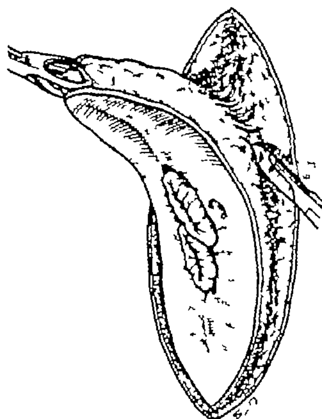


FIG 221.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS) SECOND STAGE (Cancer of the Left Colon).—Excision of the abdominal cicatrix resulting from the first laparotomy

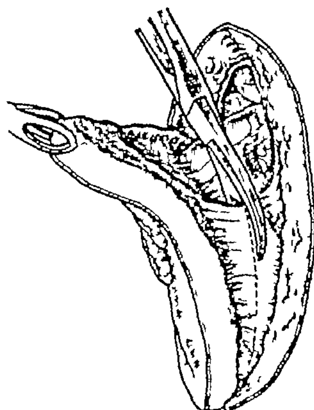


FIG 222.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS) SECOND STAGE (Cancer of the Left Colon).—The operator begins by opening the abdomen, excises some point, and then by means of scissors divides the cicatricial wall, held by the cutaneous lozenge-shaped incision.

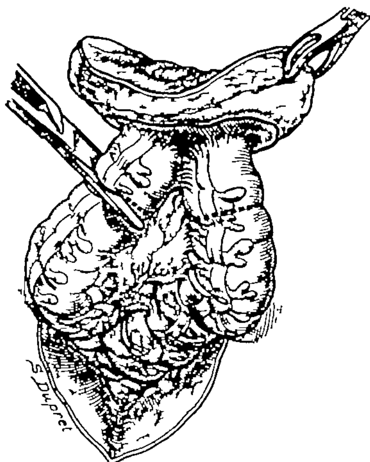


Fig. 223.—Partial Colectomy in Two Stages (Closure of the Artificial Anus) Second Stage (Cancer of the Left Colon).—Division of the two ends of the colon in a healthy part of the intestine.

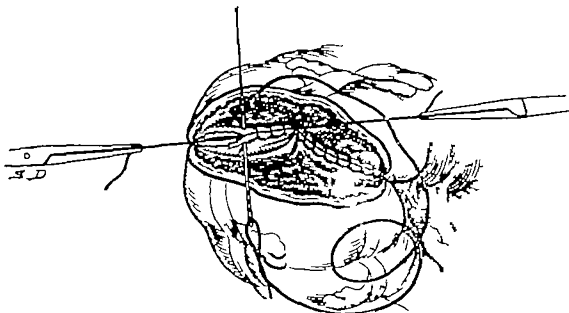


Fig 224.—Partial Colectomy in Two Stages (Closure of the Artificial Anus). Second Stage (Cancer of the Left Colon).—End to-end suture of the colon. Three fixation stitches have been introduced, one at each end of the posterior suture, and one in the middle, so as to stretch the suture well and to facilitate the application of the button hole stitch. Slowly absorbable catgut 00

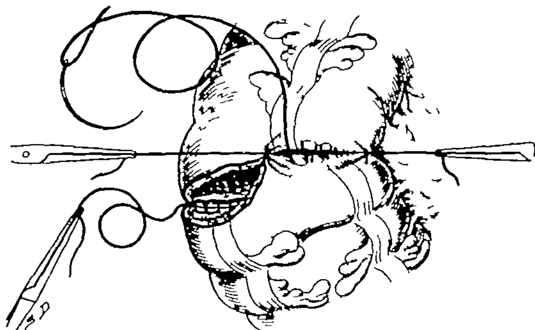


FIG. 225.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS). SECOND STAGE (Cancer of the Left Colon).—Through and through suture of the anterior wall of the colon. Connel's stitch. Note the triangular form of the stitches, which are both hæmostatic and continent. The stitch in the middle is for the purpose of dividing into two equal parts each end of the colon, and at the same time to stretch the two lips, which the suture has to bring into apposition.



FIG. 226.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS). SECOND STAGE (Cancer of the Left Colon).—The whole level is finished; it should suffice It is, however wiser to insert a second level of suture. The middle stitch is for the purpose of dividing into two equal parts the walls of the colon which are to be brought into apposition. Very fine linen.

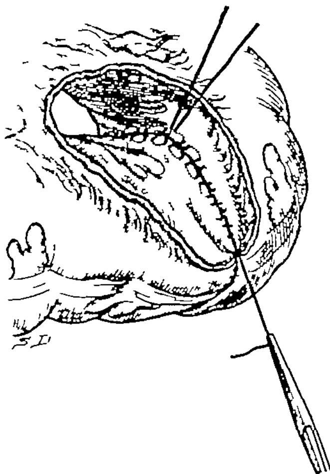


FIG 227.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS). SECOND STAGE (Cancer of the Left Colon).—Cushing's stitch. This stitch is the continuation of the posterior stitch. The ends of each thread come from each extremity and are knotted in the middle line.

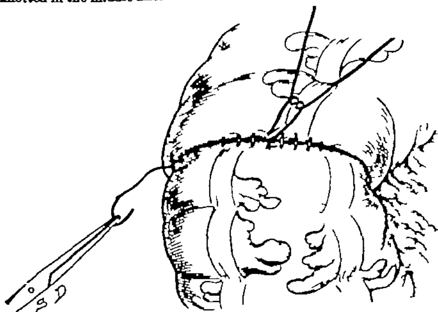


FIG. 228.—PARTIAL COLECTOMY IN TWO STAGES (CLOSURE OF THE ARTIFICIAL ANUS) SECOND STAGE (Cancer of the Left Colon).—Cushing's stitch (sero-serous) on the posterior wall of the intestine. Every end to-end intestinal suture includes two stages (a) complete closure, (b) apposition of the serous surfaces. Note the ligature of the two threads in the middle of the suture the operator avoids ending at the angles.



Fig. 229.—Partial Colectomy in Two Stages (Closure of the Artificial Anus)

Second Stage (Cancer of the Left Colon).—Appearance of the sutured intestine. Here the suture is slightly visible; in reality it is hidden. This detail gives greater security to the operation.

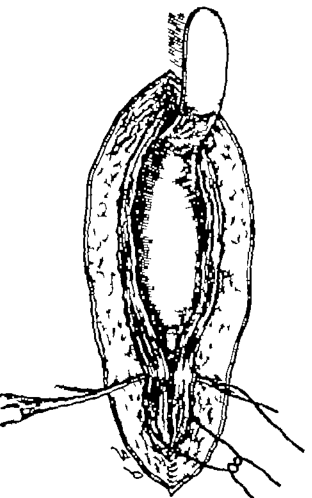


Fig. 230.—Partial Colectomy in Two Stages (Closure of the Artificial Anus)

Second Stage (Cancer of the Left Colon).—The abdomen is closed at two levels. A needle on a handle is threaded with slowly absorbable catgut; the trowel keeps the intestine in position. Clips on the skin.

IX

LARGE SCROTAL HERNIA*

A LARGE hernia is nearly always seen in the adult or in the aged It *entails an immediate and future prognosis, different from* that of a small or moderately sized inguinal hernia The operation of the latter incurs no risk, it always is carried out under local anæsthesia, and allows of convalescence in ten days without recurrence

Voluminous herniæ are generally accompanied by a feeble abdominal wall, an abdomen distended by fat insufficiency of the kidney and of the liver, cutaneous affections (intertrigo, eczema) and by malformation of the inguinal canal, which is reduced to a large ring The contents, sometimes formed of omentum, sometimes of small intestine, and sometimes of a colon which has glided, necessitate special manipulations, sometimes long and difficult The least failure in asepsis may compromise the immediate and future success

Indications for operation badly thought out and the patient badly prepared, may be the origin of serious complications—pulmonary congestion infection, etc

Inguinal hernia is a small operation large hernia is a large one Certain voluminous herniæ require even serious operations, the surgeon may, in certain cases, find himself compelled to resect a part of the intestine when it cannot be reduced.

Notwithstanding the reservations we have just made, it goes without saying, if the subject be not suffering from heart disease, or from emphysema or be not debilitated it is a good thing to operate Surgery can still be of great service success is the general rule But this operation requires a number of examinations or of precautions upon which we will insist

PROLONGED PREPARATION OF THE PATIENT —Make a complete examination. Is the tension high? Does he suffer from arterio-sclerosis? aortic disease? Is he emphysematous? or is

* This chapter has been drawn up by my colleague, Dr André Buquet. The figures, as all the others, have been drawn by S. Dupret from an operation which I performed at the hospital St Michel.—V P

azotæmia present? All these conditions would require abstinence, or at least preparatory dieting Personally, we subject all our patients to be operated upon for large scrotal hernia to a severe diet, exclusively of fruit, fat subjects, with tense abdomen, lose in this way 10, 15, or 20 kilogrammes Purgatives, general massage, exercise, and inhalations of oxygen are useful It is probable the passive arm-chair' reduction of fat (Darricau) may be of great service

The cutaneous affections, eczema, intertrigo must be treated The application of an ointment, frequent powdering, the inter position of a layer of fine and soft gauze, will readily suggest them selves Fasting, moreover, with a fruit and vegetarian diet, largely contributes to remove the skin eruptions

General massage activates the circulation and leads to loss of fat, respiratory gymnastics, the spiroscope, have not only the advan tage of increasing the vitality of the patient and of making him thinner, but also of expediting his respiratory functions and of preventing the chances of pulmonary complications so frequent after these operations Abdominal gymnastics should also be recommended to strengthen the abdomen and to give better support to the stitches

It requires often a preparation of many weeks, and even of months, before the patient is in a state to be operated upon with success The patient will be largely recompensed for his efforts, his complexion becomes fresher and clearer, his abdomen supple from disappearance of the fat, the wall more muscular, his ring less enlarged, and the hernia formerly irreducible, can be replaced without effort

Everything, moreover, we have just advised applies just as well to umbilical hernias or to eventration after operation

IMMEDIATE OPERATION —Operation being decided upon the patient is to be shaved soaped and powdered At the time of the operation, rub a large surface of the skin with ether or benzene, and then lightly paint with iodine, the tincture should be half strength, do not burn the scrotum

CHOICE OF ANÆSTHETIC —Three times out of four regional anæsthesia suffices * If the hernia be not too huge if the operator have not sufficient experience of regional have recourse to spinal

* Anesthésie régionale, by Pauchet Sourdat and Labat 3rd edition. Edited by Doin. 1920

anæsthesia We have never employed general anæsthesia for hernia for twelve years

OPERATIVE TECHNIQUE—*Cutaneous Incision*—Place the patient in the slightly dependent position Make the incision entirely abdominal, all the more so as after treatment, when the scrotum has shrunken, the line of union has a tendency to become lowered It should reach or pass above the antero-superior iliac crest, and extend for 15 to 20 centimetres

Stop immediately and completely bleeding from the vessels on each lip of the incision.

Incision of the Anterior Inguinal Wall—Lay bare with the grooved director the shiny surface of the aponeurosis of the external oblique, divide it along the whole length of the incision, and mark out each lip by tissue forceps Free the inferior flap up to the lower lip of the crural arch, the deep surface of which ought to be quite visible Free the anterior flap internally, as far as possible, up to the anterior surface of the sheath of the rectus which is to be exposed. Exteriorise the sac up to the point connected with the lower part

Division of the Anterior Layer of the Sheath of Rectus—The operator should at once note the possibility or difficulty which he will have in bringing into apposition the crural arch and the conjoint tendon. If there be sufficient play—in other words if there be sufficient material for the conjoint tendon to be easily brought into apposition with the posterior lip of the crural arch this part of the operation is not carried out If, on the other hand the size of the canal is such that after suture of the crural arch there is traction on the two fibrous tissues, it is necessary to divide the sheath of the rectus, and to liberate and mobilise the conjoint tendon, so that there is no traction once the suture is finished

The division is carried out thus place a Farabœuf's retractor on the internal lip of the divided aponeurosis of the external oblique In this way the anterior surface of the sheath of the rectus is exposed as far as possible towards the middle line, expose it from the pubis to the upper part of the wound—*i.e* very high and very low—for a length of 10 12 or 15 centimetres Open it on its whole depth 1 centimetre outside the point where the sheath of the rectus adheres to the deep part of the aponeurosis of the external oblique After the section of the aponeurosis the rectus muscle appears Free by thrusts with the grooved director the external flap of this button hole incision It is un

necessary to proceed roughly, otherwise the vessels or nervous filaments may be torn which would secondarily cause atrophy of the rectus muscle and lead to recurrence The integrity of the rectus must therefore be preserved, and, for this purpose, the vascular and nervous connections must not be separated. This slit in the sheath of the rectus is sufficient to mobilise the conjoint tendon, and to allow of its being drawn some moments later in front of the crural arch

Opening the Sac and Treatment of its Contents—Cut the sac longitudinally carefully by the knife Its contents should be treated according to their nature

(*a*) Omentum it is ordinarily adherent or chronically inflamed, and cannot be returned into the abdomen, resect it piecemeal.*

(*b*) Small intestine it is usually free in the sac, reduce it carefully with a clamp into the abdominal cavity, dependent position of the patient may be necessary It is rare for the small intestine not to be easily reduced if the patient has undergone a fast-cure But if the sac do not contain omentum and if the small intestine only occupy the hernial cavity, the cause of the irreducibility would be the mesentery itself which from fatty infiltration had come away from its right relationship to the loops of small intestine It happened to me twenty years since at the Hôtel Dieu at Amiens, to resect, in this way, an irreducible hernia in a man 1 m 50 in height, and *to remove 3 metres of intestine!* When this man died thirteen months later he had only 1 m 20 of small intestine in the abdomen Such an eventuality could not occur to me, because the anti fat cure to which I subject these patients, makes this resection unnecessary, if reduction be impossible, I would close the wound and submit the patient anew to an anti fat diet for six months and then operate (V P)

(*c*) The large intestine If the sigmoid be floating and the meso-sigmoid long reduction is as easy, requiring no special manipulations as if it were a loop of the small intestine But if the hernia be a gliding one, it is not the same The peritoneum which covers the intestine in front appears to be reflected on to the wall of the sac without forming a meso-colon, or only a very short one the hernia is thus immovable in the sac closely applied against its wall as the descending colon against the posterior abdominal wall The colon cannot be reduced in these conditions It can only be mobilised and replaced into the

* See "Practical Surgery Illustrated, Vol I p 27 *et seq*

abdomen after the enveloping fascia is separated and freed Dissect it as in a complete colectomy The large intestine, mobilised, owing to its containing enveloping fascia, is thus completely freed and is in the same condition as a small intestine, it is easily separated and returned into the abdomen Then incise close to the sac the external layer of the meso-colon, and then separate by a compress or forceps gradually the parts of the intestine, with their true meso-colon and the meso-colic vessels Continue the stripping up to the abdominal cavity, and it is only when the intestine is free in the abdomen that the separation should cease Introduce some ligatures into the meso-colon, if necessary, but this is rare, and close the sac as in an ordinary hernia

Treatment of the Sac—It is sometimes difficult to free the sac The hernia is of long standing, the sac has contracted adhesions with the scrotum hook it *en masse* by the index finger, and with a compress on forceps free its attachments to the scrotal ligament The question of castration may present itself, and depends on the age of the patient

(*a*) *If the patient be young* it is important to preserve the testicle, separate the cord from the upper part of the sac, and continue the dissection as far as the testicle, without injuring any vessel of the cord, otherwise hæmatomata will form, which prolong convalescence and compromise the circulation of the testicle If, following this liberation, there be the least hæmorrhagic oozing, carefully stop the bleeding and until this is perfectly accomplished the next stage of the operation should not be begun The cord must be freed with extreme gentleness to avoid breaking the vas deferens or provoking funiculitis intra funicular hæmatomata, etc

(*b*) *If the patient be aged*, there be a hæmatocele, or the testicle be completely atrophied, there is no question of preservation Separate quickly the united cord and sac from the scrotum, tie and divide *en masse* this allows more complete occlusion of the canal. On principle, it is better to preserve even an atrophied testicle than to remove it, it may be of some service the execution of testicular grafts has shown it

Ligature and Resection of the Sac—Free the sac as high as possible and then tie it, as in every cure of a hernia First pierce with the needle one of the halves of the pedicle, which should be strangled by strong or slowly absorbable catgut If the stump of the sac can be drawn of its own accord to the upper abdomen,

it is unnecessary to fix it to the wall, it is possible to let it go without fear If, on the contrary, it has a tendency to descend, if it "float" in the field of operation, it is desirable to fix it, then employ Barker's manœuvre—*i.e.*, fix the two threads which hold the stump to the deep surface of the transverse colon between the musculo-aponeurotic wall and the parietal peritoneum, immediately above the upper commissure of the wound in the muscles In the case which has served as a model for this operation we have fixed the stump of the sac to Cooper's ligament, which was exposed and clearly seen in the operative field It is of little importance where to place the stump, what is important is to fix it if it be floating

Restoration of the Inguinal Walls—In the case of scrotal hernia this wall is feeble, the manœuvre indicated in the cure of simple inguinal hernia (*vide* Vol I p 27, *et seq*) will, then, be indispensable here As we have said above the sheath of the rectus must be opened close to the line of insertion of the aponeurosis of the external oblique, and the external flap of this sheath mobilised. Unite the external flap of the external layer of the cut sheath of the rectus and the crural arch by some U shaped stitches with slowly absorbable catgut, the threads should be passed before being tied This suture forms the deep level of the re-formed inguinal region

Bring together the lips of the aponeurosis of the external oblique with some other catgut stitches to re-form the anterior wall Bring into apposition the fatty edges by some new stitches of fine catgut Apply Michel's clips to the skin If hæmostasis, which must be treated, appear insufficient care should be taken to make firm all the levels in one through and through suture, including skin, fat, and aponeurosis Pass some firm silkworm gut stitches to include the whole abdominal wall *en masse* before restoring the anterior inguinal wall, tie these threads after suturing the skin, over some small pledgets of gauze

After Care —Remove the clips on the seventh and the ninth day Keep a watch on the general state of the patient, look out for the tendency to pulmonary congestion, especially if he be old He should not get up until the fifteenth to the twentieth day, unless pulmonary complications occur during the first days and necessitate the patient leaving his bed earlier In addition cupping should be applied and respiratory gymnastics and general massage ordered for preventive purposes

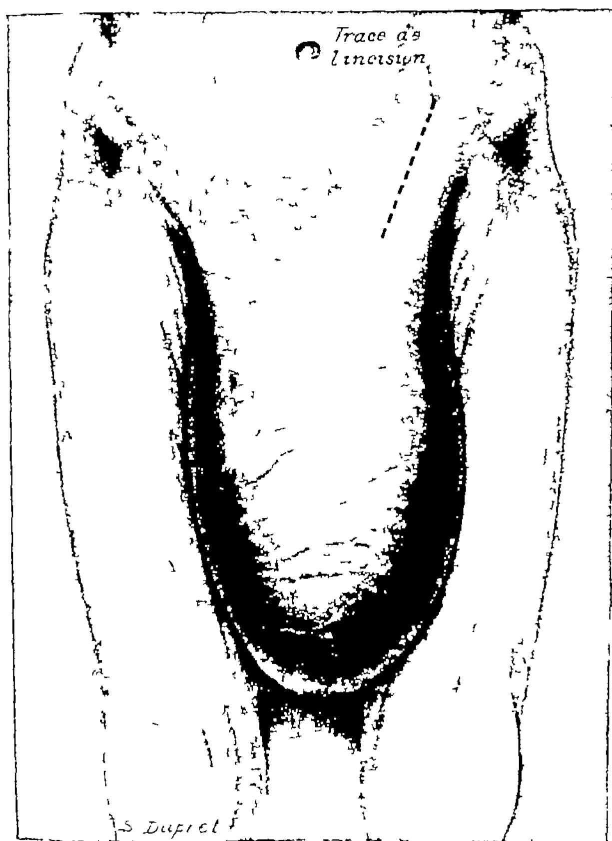


FIG 231 —LARGE SCROTAL HERNIA. RADICAL CURE.

Voluminous hernia, which appears unable to be reduced. Abdomen retracted. Tracing of the incision, which is abdominal and slightly impinges on the root of the scrotum.

Trace de l' incision = Outline of the incision

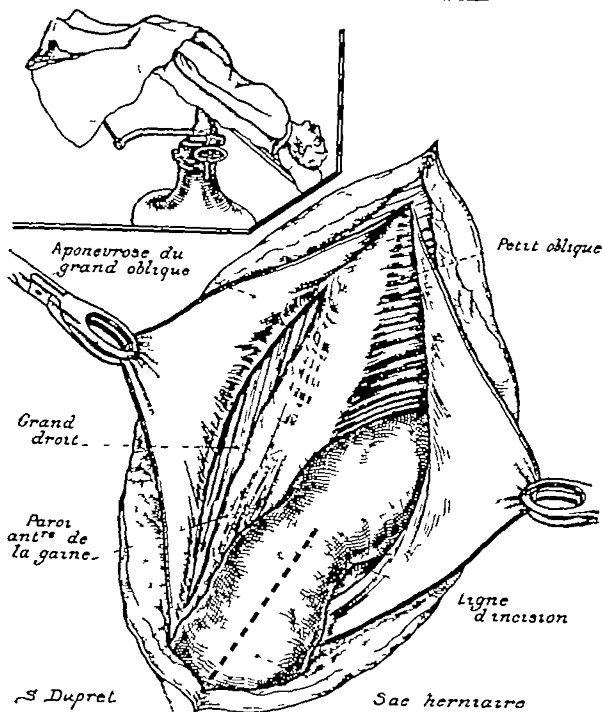


FIG 232.—LARGE SCROTAL HERNIA. RADICAL CURE.

The dependent position which is to be employed facilitates the reduction of the intestine into the abdomen. Appearance of the inguinal region after division of the skin. Division of the external oblique; incision of the sheath of the rectus within the conjoint tendon and below the tendon of the external oblique. The object of this opening is to mobilise the anterior wall of the sheath of the rectus, which is continuous with the conjoint tendon. The mobilisation of this fibrous structure permits of its being sutured to the internal lip of the crural arch. The division of the peritoneum is made here at and below the neck of the sac. But in normal cases this incision is higher on the abdominal peritoneum, immediately below the internal oblique

Aponévrose du grand oblique = Aponeurosis of the external oblique. *Petit oblique* = Internal oblique. *Grand droit* = Rectus. *Paroi antre de la gaine* = Anterior wall of the sheath. *Ligne d'incision* = Line of incision. *Sac herniaire* = Hernial sac.

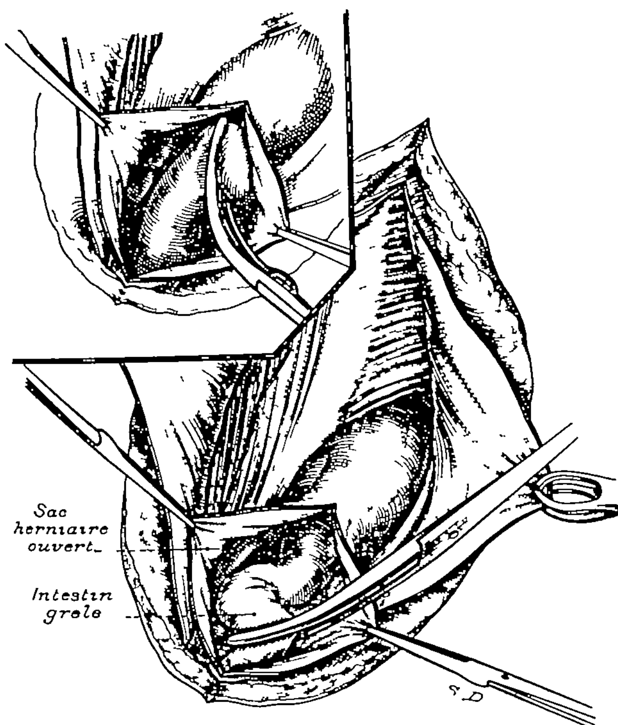


FIG 233.—LARGE SCROTAL HERNIA. RADICAL CURE.

The contents are here formed by the ileum. Owing to the dependent position the loops seized by a clamp are completely returned into the abdominal cavity although the hernia at first seemed as if it could not be replaced.

Sac herniaire ouvert = Hernial sac opened. *Intestin grêle* = Small intestine.

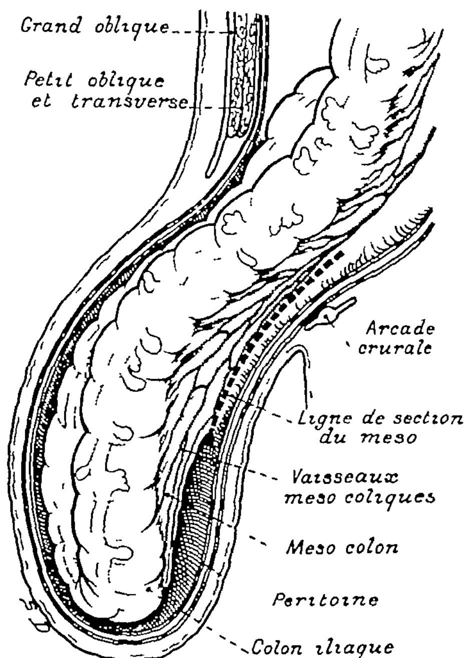


FIG. 234.—LARGE SCROTAL HERNIA. RADICAL CURE.

Here the contents are formed by the iliac colon. It is an iliac gliding hernia the intestine which has descended with the meso-colon is adherent to the sac. This loop of the colon is as easy to liberate in the sac as in the abdomen, when the enveloping fascia is freed. The dotted line shows the area on which the colon is separated from the parietal peritoneum; it is made in the sac as if it were in the left lumbar fossa.

Grand oblique = External oblique *Petit oblique et transverse* = Internal oblique and transversalis. *Arcade crurale* = Crural arch *Ligne de section du méso* = Line of division of the meso-colon *Vaisseaux méso-coliques* = Meso-colic vessels *Méso-côlon* = Meso colon. *Péritoine* = Peritoneum *Côlon iliaque* = Iliac colon

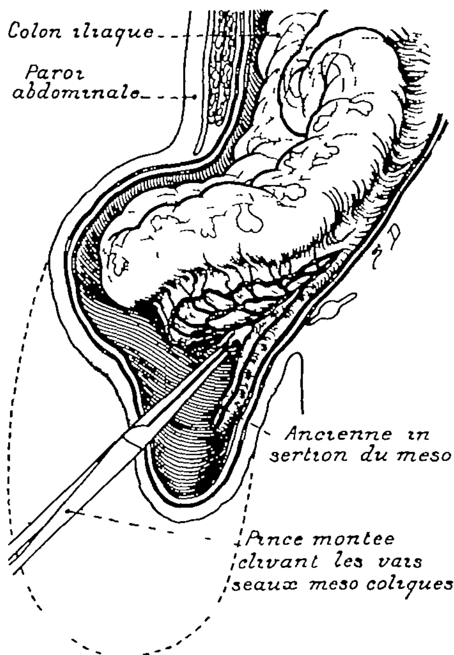


FIG. 235.—LARGE SCROTAL HERNIA. RADICAL CURE.

The contents are formed by the iliac colon. The colon is first cut from the parietal layer of the peritoneum, and then completely separated by a compress which pushes back the meso-colic vessels, without risk of tearing them. The empty sac will be treated as a sac with normal contents (omentum or small intestine).

Colon iliaque = Iliac colon. *Paroi abdominale* = Abdominal wall. *Ancienne insertion du méso* = Old insertion of the meso-colon. *Pince montée clivant les vaisseaux méso-coliques* = Compress on forceps separating the meso-colic vessels

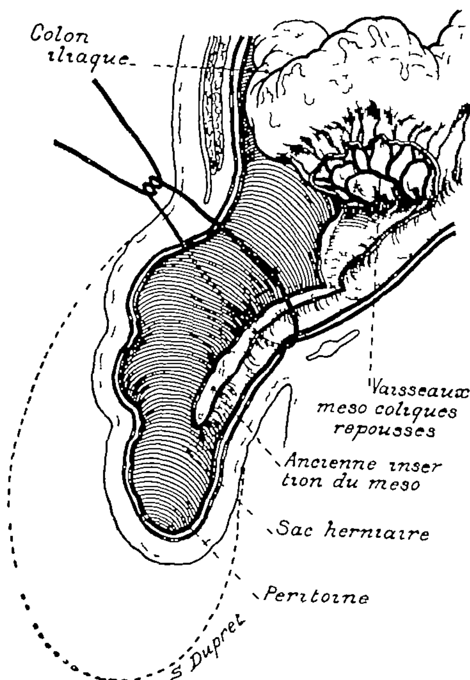


FIG 236 —LARGE SCROTAL HERNIA. RADICAL CURE.

The contents are formed by the iliac colon. The colon is returned into the abdominal cavity; the sac is tied as an ordinary sac.

Côlon iliaque = Iliac colon. *Vaisseaux méso-côliques repoussés* = Meso-colic vessels pushed back. *Ancienne insertion du méso* = Old insertion of the meso-colon. *Sac herniaire* = Hernial sac. *Péritoine* = Peritoneum.

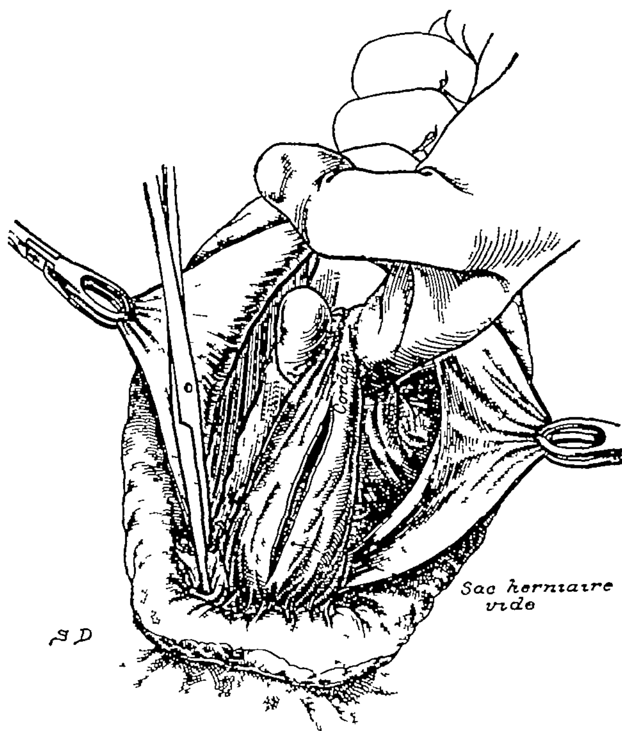


FIG 237 —LARGE SCROTAL HERNIA. RADICAL CURE.

Liberation of the cord and of the sac. The testicle is removed at the same time as the cord, so that the opening can be completely closed. Entire closure of the inguinal region diminishes the chances of recurrence. The patient is old and the usefulness of an atrophied testicle is problematical.

Cordon = Cord *Sac herniaire vide* = Hernial sac empty

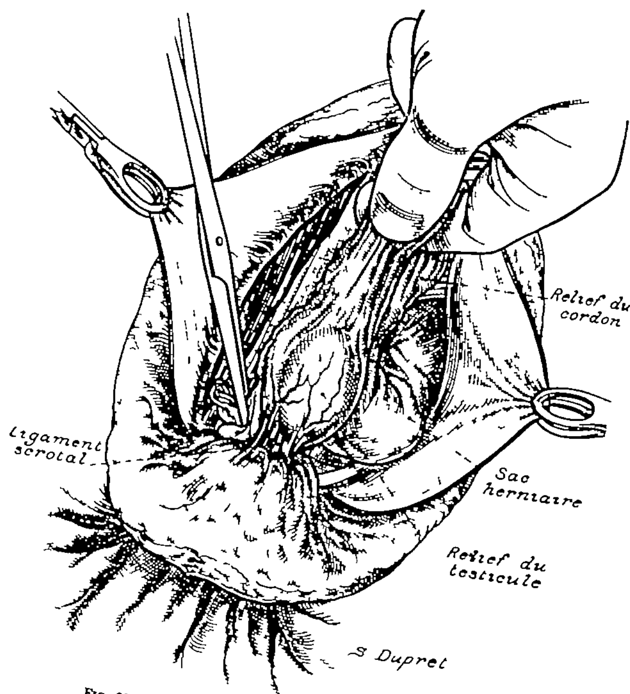


Fig 238.—Large Scrotal Hernia Radical Cure.
Liberation *en masse* of the cord, of the sac and of the testicle The compress is the best instrument to use.

Relief du cordon = Outline of the cord *Sac herniaire* = Hernial sac *Relief du testicule* = Outline of the testicle *Ligament scrotal* = Scrotal ligament

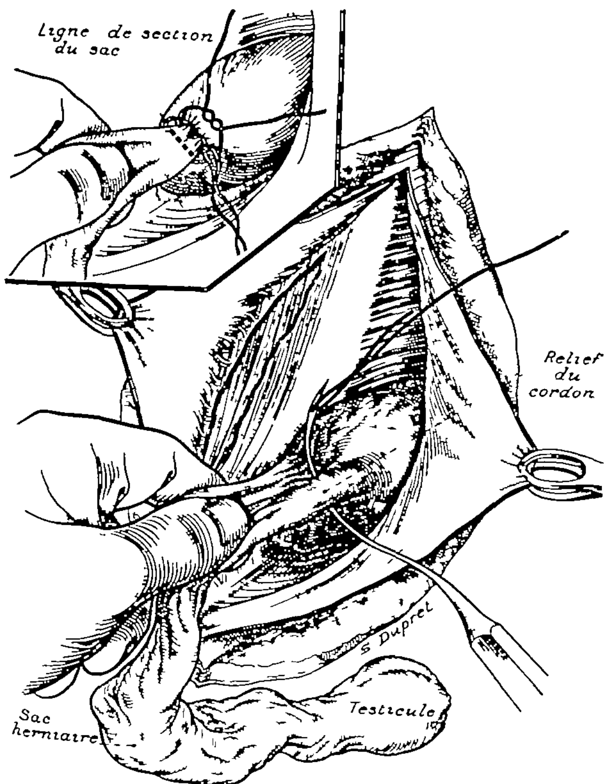


FIG 239—LARGE SCROTAL HERNIA. RADICAL CURE.

Ligature of the sac and of the cord. How to make a pedicle of the sac with the cord, and how they are tied.

Ligne de section du sac—Line of division of the sac *Relief du cordon*—Outline of the cord. *Sac herniaire*—Hernial sac *Testicule*—Testicle

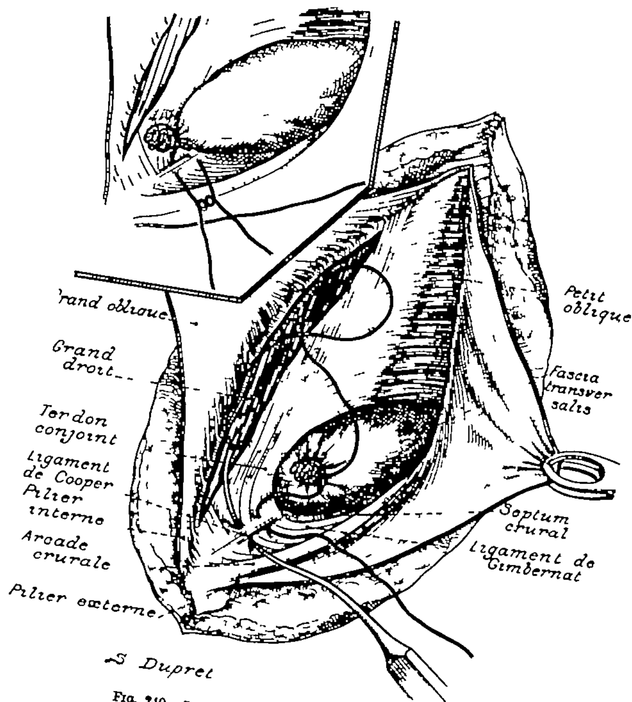


FIG. 240.—LARGE SCROTAL HERNIA. RADICAL CURE.
Fixation of the stump to Cooper's ligament so as to ensure its firmness.

Grand oblique = External oblique *Petit oblique* = Internal oblique *Grand droit* = Rectus *Fascia transversalis* = Fascia transversalis *Tendon conjoint* = Conjoint tendon. *Septum crural* = Crural septum. *Ligament de Cooper* = Cooper's ligament *Ligament de Gimbernat* = Gimbernat's ligament *Pilier interne* = Internal pillar *Arcade crurale* = Crural arch. *Pilier externe* = External pillar

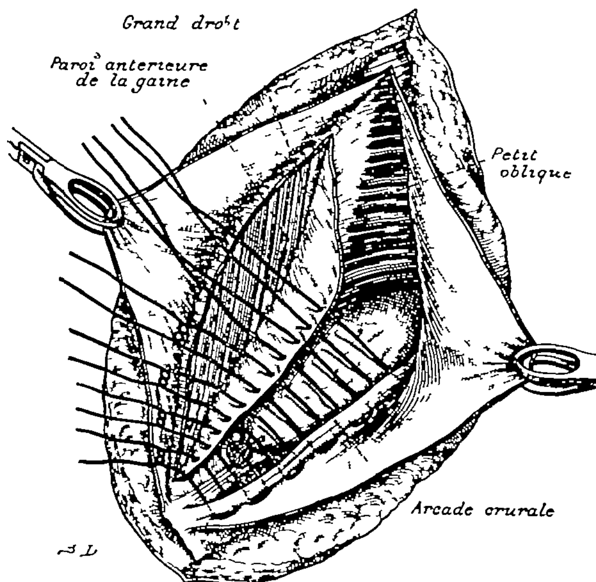


FIG 241 —LARGE SCROTAL HERNIA. RADICAL CURE.

Reparation of the inguinal wall, with complete closure of the ring This closure is made at two levels. Here the first, with *slowly* absorbable catgut. Stitches in U The external lip of the aponeurotic sheath of the rectus is sutured to the internal lip of the crural arch.

Grand droit = Rectus *Paroi antérieure de la gaine* = Anterior wall of the sheath. *Petit oblique* = Internal oblique. *Arcade crurale* = Crural arch.

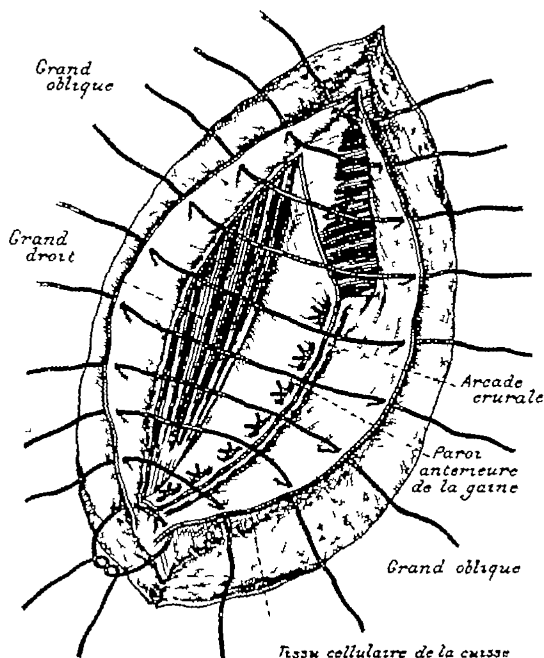


FIG. 242.—LARGE SCROTAL HERNIA. RADICAL CURE.

Closure of the anterior inguinal wall. Interrupted stitches of ordinary catgut. Note there is no inguinal ring; the opening is quite closed.

Grand oblique = External oblique *Grand droit* = Rectus *Arcade crurale* = Crural arch *Paroi antérieure de la gaine* = Anterior wall of the sheath *Grand oblique* = External oblique *Tissu cellulaire de la cuisse* = Cellular tissue of the thigh.

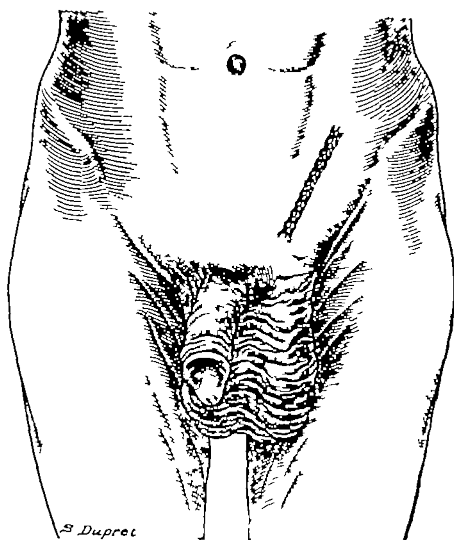


FIG 243.—LARGE SCROTAL HERNIA. RADICAL CURE.

Suture of the skin with clips. Compare Fig 243 with Fig. 231 to note the situation the division of the skin really occupies, and which has returned to its normal position. Appearance of the testicles and of the penis after operation.

X

COMPLETE ABDOMINAL HYSTERECTOMY FOR SUPPURATION OF THE ADNEXA*

THE inflammatory affections of the uterine adnexa should be always treated medically—rest, heat or cold, ice or hot water, diet vaccines, etc If they be cured completely, the patient can return to her occupation, if they become worse or be incompletely cured, or recur, operation should be performed

On principle, if the woman be young, it is preferable to excise only the tubes, leaving the uterus and the ovaries, the operation is more difficult, but gives more often excellent results The uterus should not be removed at once, and with still greater reason the uterus and the ovaries, unless the woman have passed forty five years of age or the lesions or the safety of the operation absolutely require it

The cases where it is necessary to intervene, it may be urgently or quickly, are the following

(a) *Rupture of a Tube*—Urgent operation is obligatory, as in every rupture within the abdomen, and with greater reason after rupture of an abscess

(b) *Acute Pyosalpynx*—If a large tube bulge into Douglas pouch, open it by vaginal colpotomy, if the adnexa be situated high up, and it be necessary to act rapidly, perform abdominal hysterectomy If the temperature be elevated, and the general condition precarious, vaginal hysterectomy, with or without separation of the vagina, is to be preferred.

(c) *Peri Uterine Abscess*—This is extra-adnexal and generally protrudes into Douglas pouch, it ought to be treated by simple colpotomy

(d) *Exacerbation of Salpingitis*—Inflammation of the adnexa is being treated and in spite of the medical treatment the symptoms become aggravated, after having appeared to improve, the tubes

* This chapter has been written by my colleague, Dr Gabriel Luquet. The figures have been drawn, as the others, by S Dupret, from an operation performed by me at the hospital of St. Michel.—V P

increase in size, and examination is more painful, it is advisable to intervene as soon as possible Hysterectomy during a quiescent period should be performed in the majority of cases

Most often, the indication is not at all urgent, the inflammatory exacerbation of the adnexa ends by resolution, or, again, it seems to resolve and then recurs The adnexa remain palpable, large, or painful, operation is compulsory as the patient cannot return to her occupation The operation should be performed three weeks, two three, or four months, after the commencement of the cessation of the symptoms

With Siredey* we consider, then, operation necessary in the following conditions

1. In cases of rupture of a suppurating tube, it is an indication of urgency

2 In the suppurative forms which do not rapidly yield to medical treatment

3 In the torpid prolonged suppurative forms in which local examination of the lesions shows increasing tension of the inflammatory mass, œdematous infiltration of the neighbouring regions, and the presence of a particularly painful prominent point

4. In the forms which persist indefinitely or with frequent exacerbations, ending by causing a neurotic condition or by preventing women who have to work, owing to their social condition, from doing any

What procedure is to be employed ?

There is no best method, *there are many methods* which, according to the existing case, are of unequal value Each may be the best or the worst It is necessary to be cognisant of all, and to know in each particular case what to decide for the best (J L Faure) †

As the adhesions to the neighbouring walls may vary, we ought to modify our procedure according to the position of the lesions and to employ the one which allows us to proceed by the least inconvenient route for removing the inferior attachments of the uterus and of the adnexa so as to be able to separate the mass from below upwards (J L Faure).‡

Subscribing to these two principles we will describe a method which may be of service in some anatomical forms of acute or

* J L Faure and Siredey Traité de Gynécologie Médico-Chirurgicale, p 615

† *Presse Médicale*, January 20 1901

‡ J L. Faure and Siredey "Traité de Gynécologie Médico-Chirurgicale"

subacute lesions of the uterus and of the adnexa We should make use of it in two kinds of cases

(a) When the diseased adnexa of both sides are glued to the pelvic walls and to the uterus

(b) When the uterus is irreducibly retroverted and tips over with the adnexa into Douglas pouch

It is a procedure derived from the methods employed in anterior dissection in incomplete hysterectomy, on the advantages of which J L Faure and Th de Martel have so much insisted.* It takes its origin also from Doyen's method. It allows of the liberation of the uterus from its inferior attachments, and of attacking the adnexa from below upwards

Operative Technique —In the case here drawn we had to do with a double pyosalpynx, with the uterus and the adnexa adherent to the rectum and to the pelvic wall

Anæsthesia —Spinal

Trendelenburg s position

The vagina was dressed the preceding days with a drain of gomenol, and painted with iodine, before operation under the control of the eyes, with the use of a speculum

First Stage —A median laparotomy from the pubis to the umbilicus was performed It is necessary to see clearly Insertion of a suprapubic retractor, Doyen s or Rochard s

The intestine was carefully pressed back by large compresses, on no account should the intestinal loops be in contact with the operative field The edges of division of the abdominal wall ought to be equally well protected Dartigues laparostat separated the upper part of the lips of the incision

Second Stage —Examination of the operative field The fundus of the uterus was seized with tissue forceps (or Museux s forceps may be used), and endeavour was made to mobilise the adherent uterus and the adnexa anteriorly

During these manipulations a purulent pocket may open, immediately the pus which is discharged is to be absorbed by compresses, or better, by the aspirator

Third Stage —Mobilisation of the uterus having been tried posteriorly we returned to the anterior and incised, in the region between the bladder and the uterus, the anterior peritoneum from one round ligament to the other The peritoneal layer was retracted

* *Presse Médicale*, 1909 p 617

downwards as well as the bladder by curved scissors, and then by a compress on forceps

FOURTH STAGE —Drawing the uterus upwards, by catching hold of the fundus by Museux's forceps, the antero-superior part of the vagina near its insertion on the neck was seized by a second pair of forceps, and having thus been firmly fixed, the whole circum ference of the vaginal canal was divided by a knife (scissors may be used), including the posterior peritoneal layer, so as to open Douglas pouch If the uterine arteries be visible, catch them otherwise do not trouble about them, later on returning to them, when the field of operation has been cleared The aspirator drew off the pus which was present in Douglas pouch, and the mucus discharge which swelled up from the vagina, which was painted afresh with iodine

FIFTH STAGE —Slipping one or two fingers behind the broad ligament at the side where the adnexa were least adherent and separating them from below upwards, they were thus formed into a pedicle The infundibulo-pelvic ligament, as well as the round ligament were seized by the same clamp, other forceps were placed nearer the uterus and an incision made between the two forceps The adnexa of this side were thus freed

SIXTH STAGE —The body of the uterus was gently, always from below upwards, separated from the anterior surface of the rectum, then we attacked the larger and more adherent adnexa If the purulent pockets seem to be too large to be mobilised easily with out breaking them, there should be no *hesitation in opening and* aspirating them

We stripped the adnexa from below upwards, formed them into a pedicle, and divided the pedicle between two clamps

The uterus and adnexa were removed *en bloc*

SEVENTH STAGE —The pelvic cavity, and especially Douglas pouch were dried carefully by compresses (or an aspirator can be used) and then the vascular pedicles were tied

First tie the inferior pedicles including each uterine artery and its cervico vaginal branches which arise here, by means of a needle on a handle a thread was passed with its fixation point on the edge of the vagina and taking in the whole portion of the neighbouring hypogastric sheath enclosed in the triangular space, the base of which was at the vaginal wall, and the apex at the uterine artery *

* Escudié, *Thèse de Paris* 1910

Then the two superior pedicles, each including the uterine and ovarian vessels and the round ligament, they can most often be caught *en masse* without trouble

Four ligatures should thus suffice to procure hæmostasis of the pelvis

If other vessels bleed, some additional threads are then introduced

EIGHTH STAGE —The anterior vesico-uterine peritoneum was fixed by a continuous suture to the anterior margin of the vagina If it be possible, the continuous suture should be continued on each side in the endeavour to bury the upper pedicles, but in these cases, as in that we have taken as a type, it is more often impossible and should not be insisted upon

An accident may occur when the posterior surface of the retroverted and fixed uterus is separated from below upwards—viz, incomplete or complete laceration of the anterior wall of the rectum

If the serous coat be torn or frayed, some interrupted sutures should be introduced into it If the tear be complete and include all the coats, it should be repaired at two levels After cleaning the wound with iodine and ether, a small continuous suture is to be introduced into the mucosa This being done a series of U stitches are to be applied, parallel to each other, including only the serous and the muscular coats, they should not be perforating When they are all passed they should be tied and knotted

To assure drainage below, a large drainage-tube was passed into the vagina from above downwards, reaching only a short distance into the pelvis

NINTH STAGE —To procure drainage above, a Mikulicz drain was used, especially if pus has been discharged during the operation, and if raw surfaces persist from the impossibility of covering them with peritoneum, it should be employed without hesitation.

The bottom of the sac is first to be placed firmly on the whole of the small pelvis It should be kept in position by methodically inserting some layers of gauze or compresses, but not, however, too tightly It is wise to place in the middle a tube with no lateral openings, which will allow of aspiration or drainage drop by drop, if need be, afterwards, and especially it will permit of the drains being abundantly moistened, so that they can be easily withdrawn eight or ten days later

The whole drain should come out from the bottom of the wound

TENTH STAGE —The upper part of the laparotomy incision was closed at one level by bronze wire, and with clips to the skin

Be careful not to put the last bronze stitch too low, so as to strangle the Mikulicz drain, as this will impede drainage and render its removal very difficult

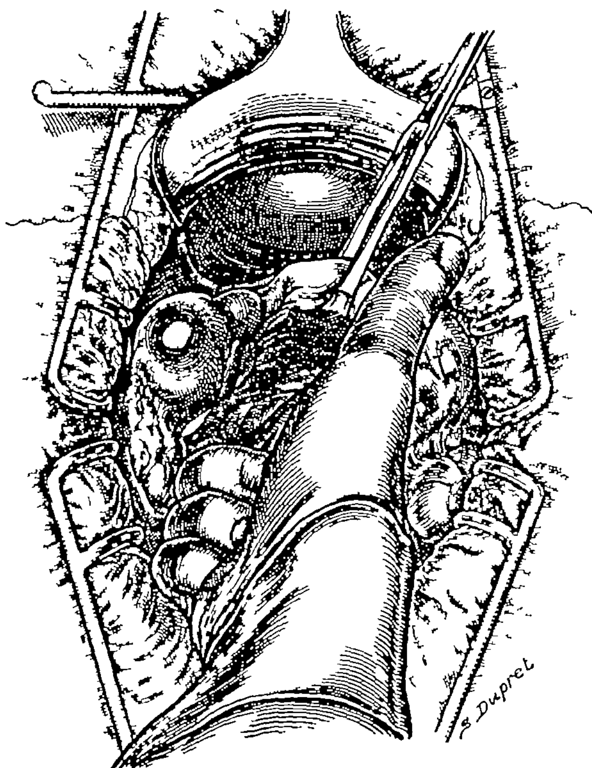


FIG 211 —*Double Pyosalpinx.* ABSCESS IN DOUGLAS POUCH POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

The uterus held by forceps. The index finger tries to free the left adnexa.

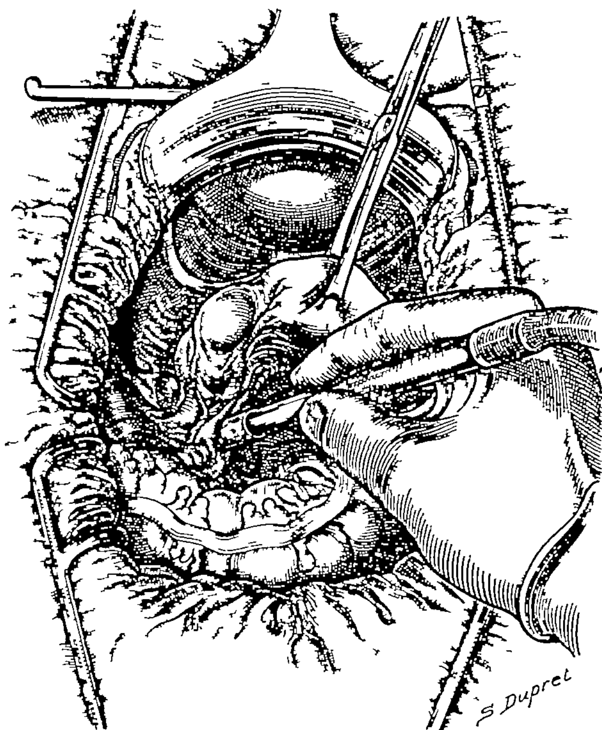


FIG 245.—DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

The attempt at liberation posteriorly and on the left side ruptures the tube By the use of the syphon aspirator introduced into the perforation, the pus is evacuated without contaminating the field of operation.

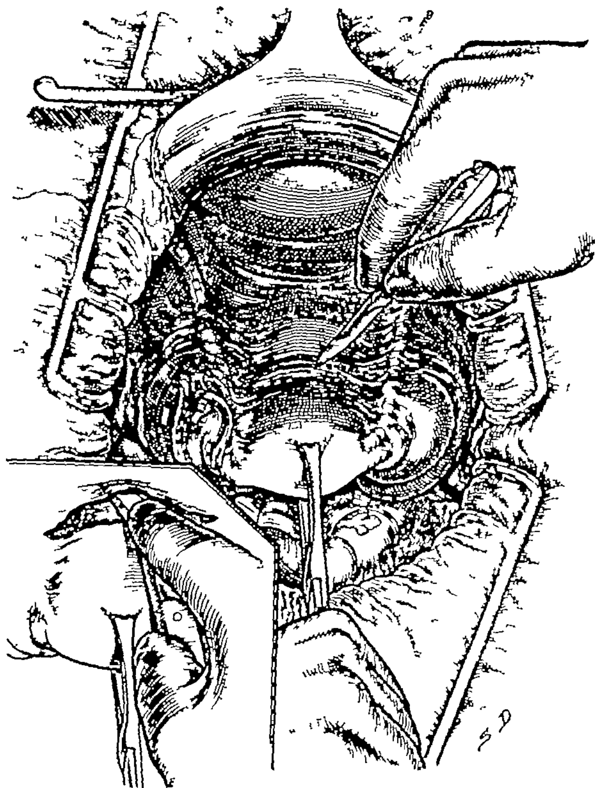


FIG 216.—DOUBLE PYOSALPYNX. ABSCESS IN DOUGLAS POUCH POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

The adnexa and the uterus are adherent posteriorly the operator attacks the uterus in front. Incision of the peritoneum covering the uterus and the bladder



Fig 247.—Double Pyosalpinx. Abscess in Douglas Pouch. Posterior Adhesions of the Uterus and of the Adnexa. Subfebrile. Complete Abdominal Castration

Opening the vagina (anterior fornix). Separation of the cervix; on the left, the uterine artery; in the posterior fornix, a pelvic abscess communicates with the adnexa.

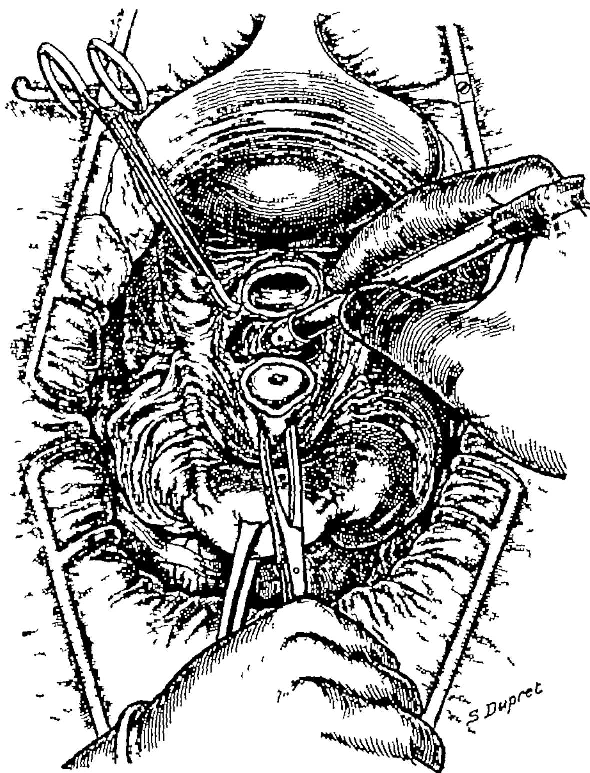


FIG 248 —DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS' POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

The pelvic abscess is emptied by the aspirator The left uterine artery is seized by J L. Faure s forceps

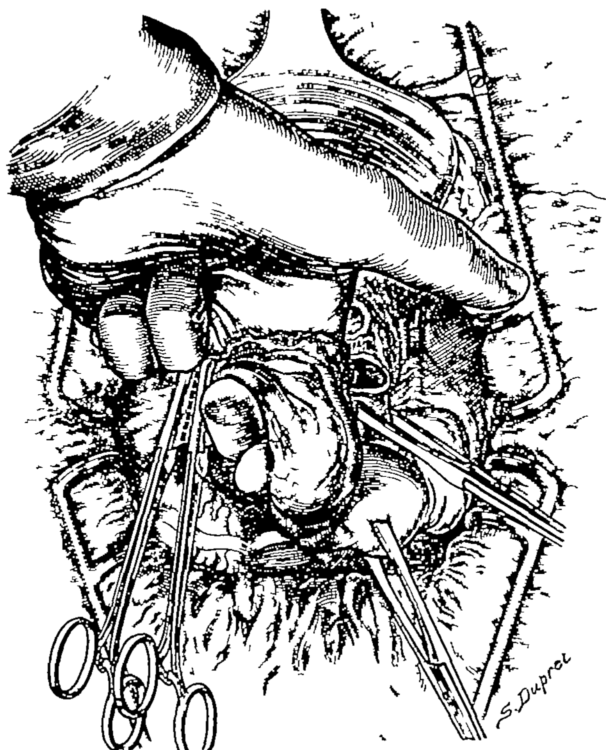


FIG 249.—DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS' POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL HYSTERECTOMY

The pelvis being dried by aspiration, the adnexa are freed from before backwards and from below upwards two duck bill forceps seize the broad ligament which is divided outside the adnexa.

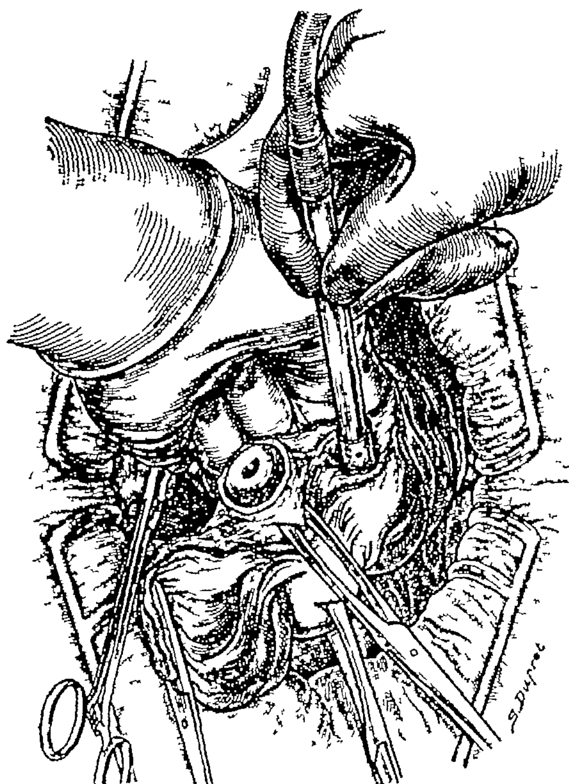


FIG 230.—DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

After liberation of the left adnexa, the operator attempts to separate the right adnexa from before backwards and from below upwards. During this separation, the right salpynx is opened, but is immediately emptied by aspiration



FIG 251.—DOUBLE PYOSALPYNX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL HYSTERECTOMY

The right pocket dried as the left pocket the adnexa are freed and pediculised before division (duck bill forceps).

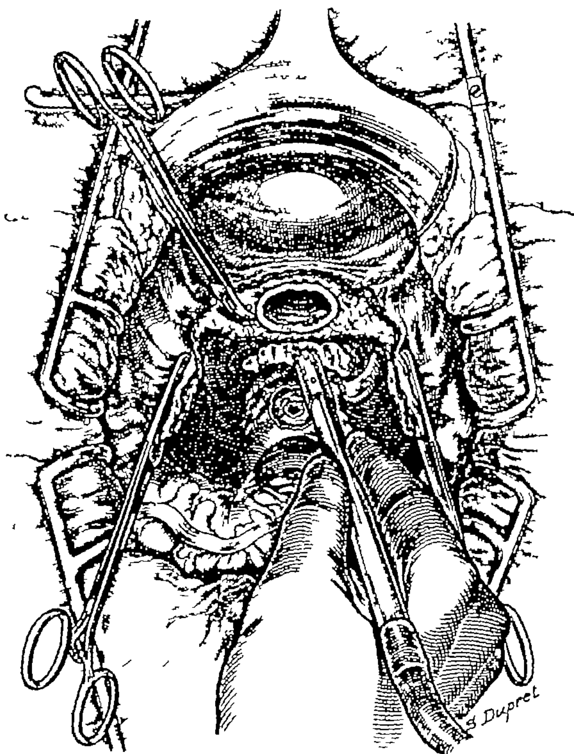


FIG 252.—DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

The bottom of Douglas' pouch, before empty is filled with blood, which is aspirated perforation of the rectum and sigmoid. J L. Faure s forceps on the uterine artery Duck bill forceps on the ligaments.

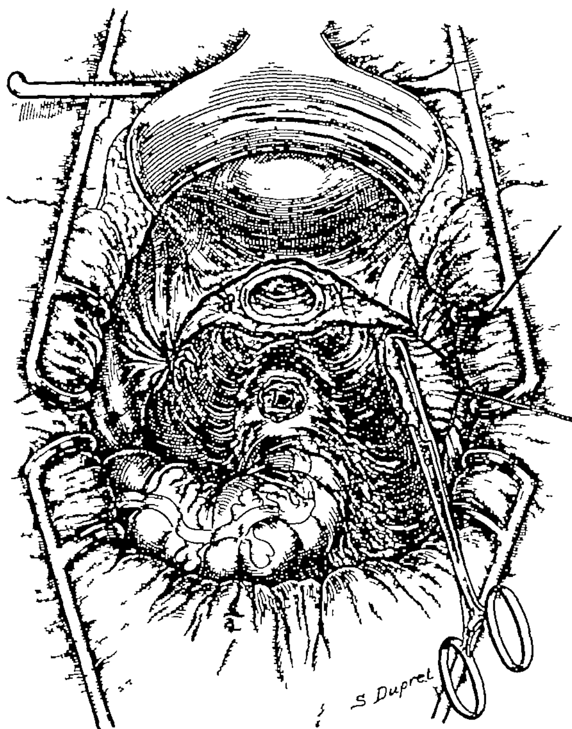


Fig. 253.—Double Pyosalpinx. Abscess in Douglas Pouch. Posterior Adhesions of the Uterus and of the Adnexa. Subfebrile. Complete Abdominal Castration

The left utero-ovarian pedicle is tied the right is being tied.

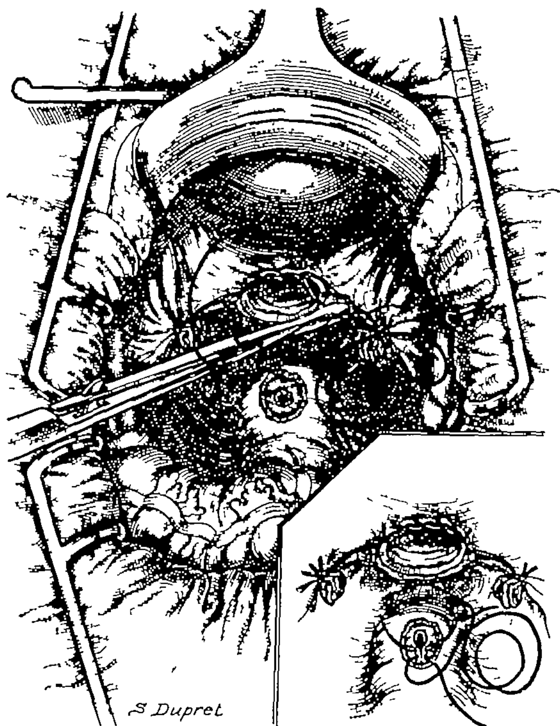


FIG 234 —DOUBLE PYOSALPYNX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

The vesical peritoneum is sutured to the anterior margin of the vagina. It is better not to suture the peritoneum of Douglas pouch, which has been soiled by pus and is irregular bleeding and roughened. Dartigues instruments.

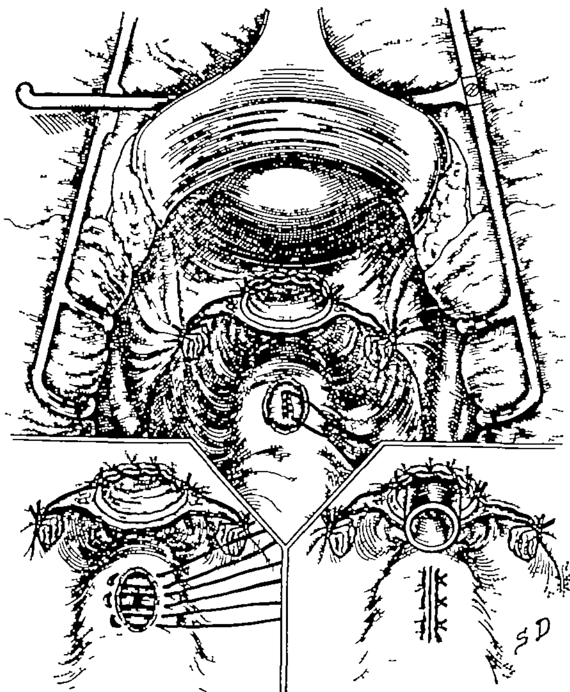


FIG 255.—DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS' POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

Closure of the recto-sigmoidal perforation. Vaginal drainage.

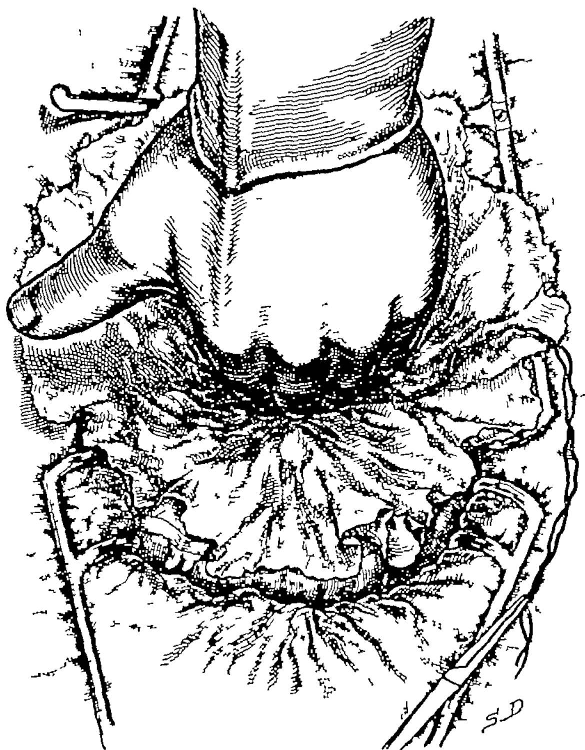


FIG 236.—DOUBLE PYOSALPINX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

Introduction of Mikulicz's drain. The thread is in the centre of the pocket. The band fashions the base of the sac around Douglas' pouch and the pelvis.

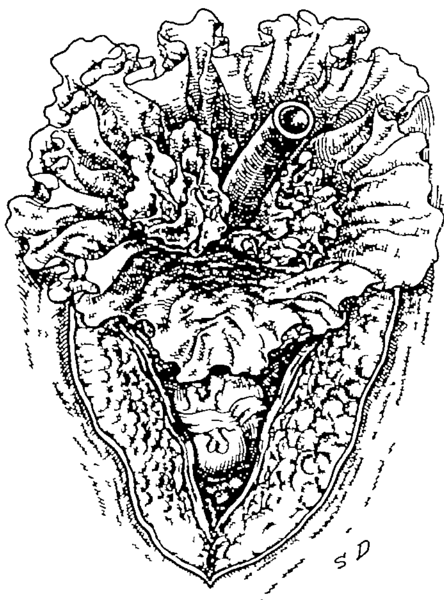


FIG 257.—DOUBLE PYOSALPYNX. ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE COMPLETE ABDOMINAL CASTRATION

Two compresses tampon the pelvis in the middle of the sac. In the centre a tube allows the introduction of fluid for separating the gauze.

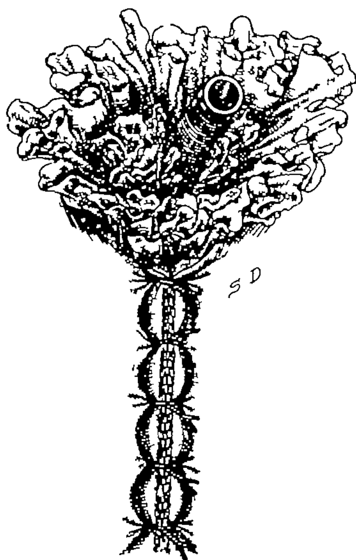


FIG 258.—DOUBLE PYOSALPYNX ABSCESS IN DOUGLAS POUCH. POSTERIOR ADHESIONS OF THE UTERUS AND OF THE ADNEXA. SUBFEBRILE. COMPLETE ABDOMINAL CASTRATION

Closure of the abdomen at one level with bronze wire, as is the rule in cases of drainage and of suppuration. Mikulicz s drain should remain in position ten to twelve days.

XI

HYSTERECTOMY OF THE FUNDUS

FORMERLY, when the surgeon discovered a bilateral affection of the tubes, he performed complete castration he removed the uterus and the ovaries If the patient were at the menopause castration did no harm, but if the patient were young symptoms arose which were all the more marked as the affections of the adnexa were less pronounced These symptoms slight if the case be one of double pyosalpynx, are more marked with hæmatosalpynx, hydrosalpynx or a small salpingitis I do not speak of fibro-cystic ovaries, the removal of which is not only useless but constitutes the worst treatment possible for this affection

Leaving the ovaries behind after removal of the uterus does not diminish the disorders of an early menopause The subcutaneous graft of an ovary is practically without result Ovarian opotherapy by the mouth gives inconstant results which depend probably on the variable method of preparation of the substances It is therefore necessary—each time it is possible—to leave the uterus, or a part of it, with two ovaries or one or half an ovary, in this way the periods continue, and the disorders connected with an early menopause are avoided Therefore when the surgeon operates on a woman twenty to forty years of age, he should leave if possible, the ovaries and a sufficient part of the uterus for the menses to continue If the adnexa and the uterus be aseptic (hydrosalpynx, hæmatosalpynx) the operator should remove the tubes and keep the ovaries and the uterus If there be a fibroma of the fundus uteri it may be enucleated, but if a part of the uterus be degenerated, the upper part should be excised and the lower preserved If the case be one of salpingitis the tubes are to be removed and the ovaries or one of them preserved, the intra uterine part of the tubes should be sterilised by the cautery, by excision of a piece of the uterus, or by resection of the fundus, the latter should be chosen if the uterus be large and congested and show external signs of a chronic infection It is to these cases hysterectomy of the fundus is applicable

We have performed this operation three times, after seeing it executed at the St Louis Hospital by Lecène who has published a work on the subject in the *Journal de Chirurgie* June, 1922, vol xix., No 6, p 561.

The following are the indications

(*a*) Bilateral inflammation of the adnexa, with complete or relative integrity of the ovaries or of a piece of the ovary

(*b*) A non-enucleable fibroma of the fundus uteri.

(*c*) Serious metrorrhagia, due to hæmorrhagic endometritis, without salpingitis

(*d*) Extra uterine pregnancy with affection of the opposite tube

The contra indications are

(*a*) Double, adherent, suppurative inflammation of the adnexa, which requires complete castration

(*b*) A single and enucleable fibroma in a woman less than forty years of age to whom myomectomy is applicable

(*c*) Unilateral salpingitis, without concomitant endo-metritis (rare) We should be content with unilateral removal of the tubes or of cuneiform resection of the angle of the uterus

(*d*) Extra uterine unilateral pregnancy Unilateral castration is sufficient

Technique of Hysterectomy of the Fundus —The object of the operation is to remove the part of the fundus of the uterus which is the chief site of the hyperplastic endo-metritis often accompanied with polypoid vegetations This endometritis often persists after castration If the uterus be left entire, the patient still has metrorrhagia after the operation, and muco-purulent discharge which require secondary hysterectomy After cuneiform resection of the fundus of the uterus and removal of the tubes, the patient is placed out of the reach of secondary complications and of repeated operations (Lecène)

(*a*) *Median or transverse laparotomy*

(*b*) *Seize the fundus with tissue forceps* Spare the upper uterine pedicle (operate on one side and then on the other) catch hold of the tube with ring forceps strangle the meso-salpynx with Kocher's forceps to stop up the vessels close to the ovary, cut the meso-salpynx above the forceps free the tube from the infundibulo pelvic ligament to the uterine angle then go to the opposite side, unless the bad condition of the adnexa necessitates complete sacrifice of the ovary on this side

(c) *Hæmostasis of the Uterus*—Place J L Faure's forceps on the uterine artery, below the point of section of the uterus

(d) *Cuneiform Hysterectomy*—The two tubes, liberated, and held only by their uterine pedicle, perform a cuneiform division of the fundus uteri at each uterine border

Division of the Uterus—Hollow out with the knife an angle with the base below and a hollow at the apex The base is to be limited in front by the insertion of the round ligaments, this section removes the most diseased part of the mucosa—*i.e.*, the angles—and the interstitial portion of the tubes But if the uterus be very large as a result of metritis, the incision must be lower, comprising the insertion of the round ligament, only leaving intact a part of the uterus at least 3 centimetres above the isthmus. Catch and tie the bleeding vessels Suture the uterus by five catgut stitches which are to include the whole wall of the uterus

(e) *Peritonisation*—This is formed from the vesical peritoneum which is mobile, with plenty of tissues Pierce the peritoneum twice, first the pelvic peritoneum on the posterior surface of the uterus, lower than the line of the uterine suture and then the utero-vesical peritoneum, immediately behind the bladder Raise with dissecting forceps a fold of the peritoneum of the bladder sufficiently large for the thread to pass easily Before tying this stitch pass two other threads one on the right and one on the left, their direction should be identical If it be preferable to pass three threads before tying, it is for the purpose of bringing the serous surfaces more exactly into apposition The vesical peritoneum assures perfect peritonisation of the uterine stump

What are the Results ?—Personally we have only performed this operation three times in one case convalescence was long the patient for some weeks had a slight elevation of temperature (37 8° to 38°) from the fixation of the uterine stump The two others recovered well Of three patients, in two the periods continued, in the third they ceased

In the past I performed hysterectomy of the fundus without wishing to do so—*i.e.* I performed hysterectomy leaving too long a lower segment—and to my great astonishment the menses were preserved Some days since a young woman (thirty five years of age) operated upon seven years before, in this way came to me for menorrhagia which I propose to treat by deep radio-therapy

Lecène reports on twenty one cases, seventeen of which have been seen again. In all the patients the uterine stump was on digital

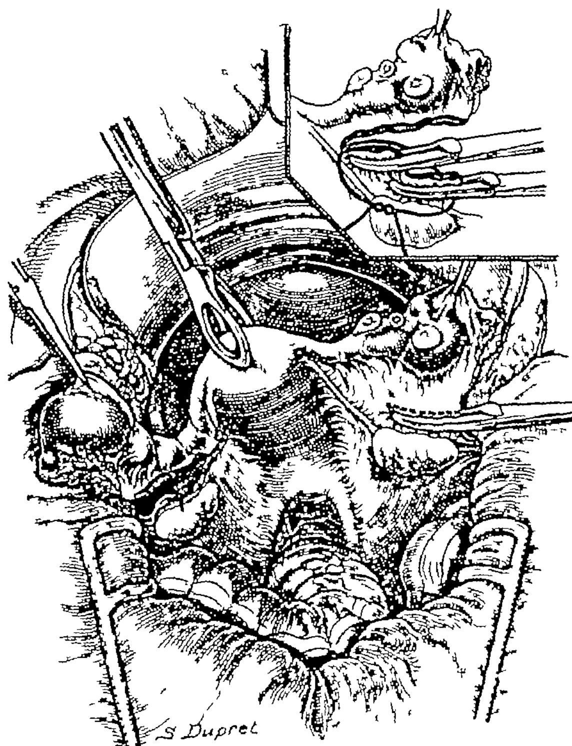


FIG 239 —HYSTERECTOMY OF THE FUNDUS.

The patient who has served as a model had a double suppurative salpingitis. She was twenty five years of age. The uterus was enlarged and could not be entirely preserved. The operator decided to divide the uterus at an equal distance between the fundus and the lower opening of the cervix—*i.e.* about a thumb a breadth above the cervix. The two ovaries were preserved. Here the operator divides the broad ligaments and isolates the two tubes. The tubo-ovarian ligaments are cut Above and to the right, hæmostasis of the broad ligaments.

examination found to be anteverted, painless and movable and there were no subjective symptoms The result has been excellent No disorders of an early menopause The periods were less abundant,

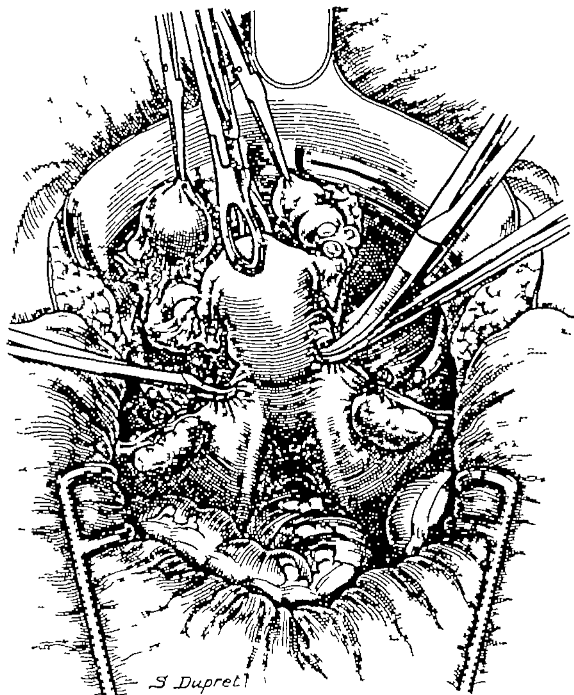


FIG 260 —HYSTERECTOMY OF THE FUNDUS

Hæmostasis of the uterine arteries (J L Faure s forceps) The division is made one thumb s breadth above the cervix uteri. The two ovaries are preserved. The tubo-ovarian ligaments have been tied.

but regular In 20 per cent of cases as abundant as after the operation

To sum up, hysterectomy of the fundus is a conservative procedure, which allows us to expect the continuation of the periods in 75 per cent of cases. This method has its exact but limited indications It must, therefore, be employed wisely if we desire to obtain favourable results (Lecène)

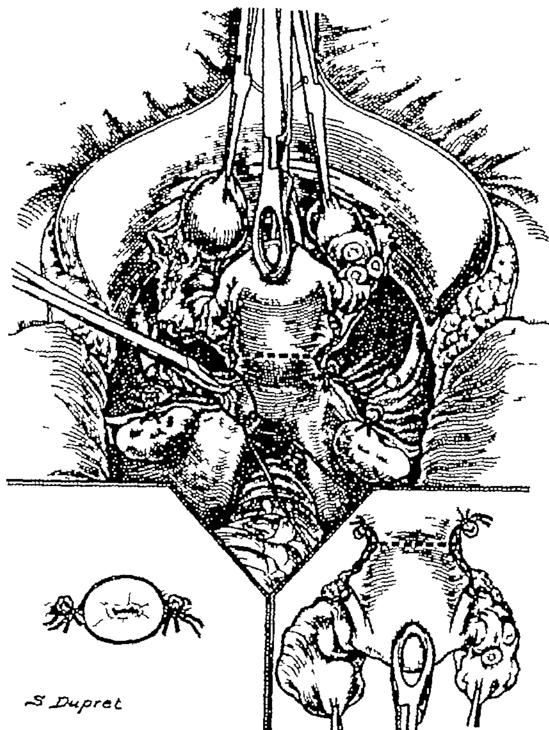


FIG 261.—HYSTERECTOMY OF THE FUNDUS.

Above, ligature of the uterine arteries. The dotted line shows the point of section; here it is as low as possible, because the uterus was diseased. If the division were made still lower it would not be a hysterectomy of the fundus, but a supra vaginal hysterectomy It is necessary to preserve a certain depth of the body of the uterus for the menstrual function to be carried on. Below and to the right, the dotted line indicates where the section should be made. On this side also the division is as low as possible Very often the incision is made below the round ligaments.

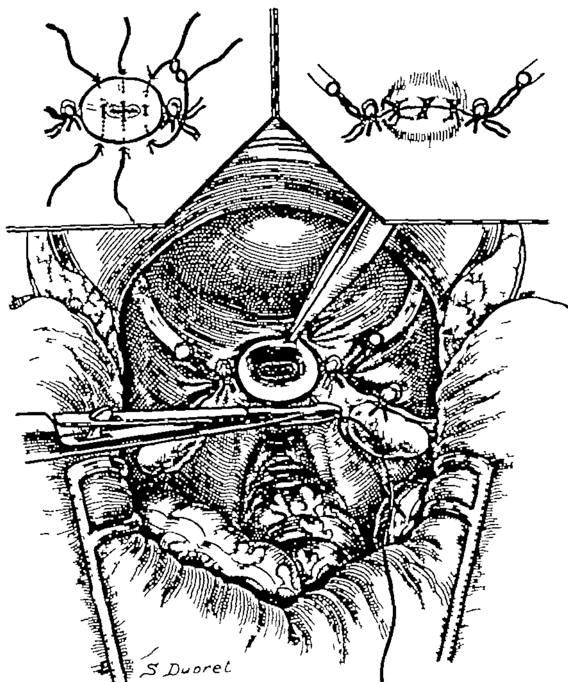


FIG 262.—HYSTERECTOMY OF THE FUNDUS.

Below division of the uterus. The section is made crescent-shaped, so as to form a conoid cavity In the centre of the uterus the healthy mucosa is seen. The lips of the uterine wound are brought together by slowly absorbable catgut; no stitch perforates. Above and to the left, position of the three catgut stitches which close the uterus. On the right, appearance of the uterus when the three stitches are tied.

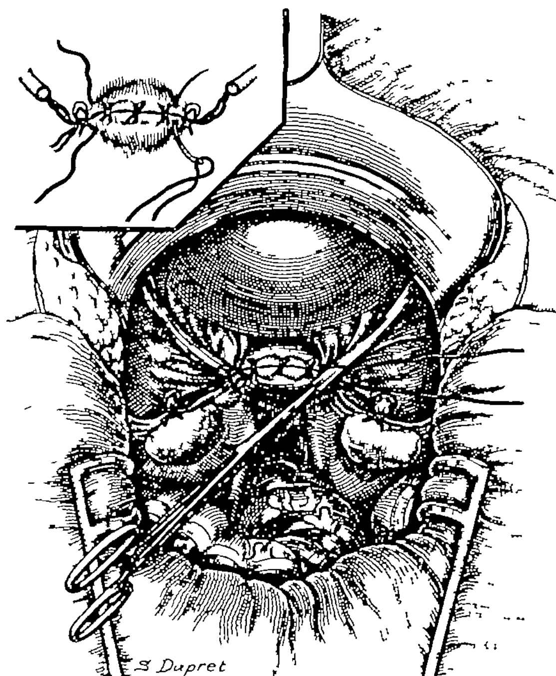


FIG 263 —HYSTERECTOMY OF THE FUNDUS.

Above and to the left, two stitches are introduced into the uterus, quite near the ligature of the uterine artery; they are for the purpose of stretching the round ligament, so as to assure suspension of the uterine stump. Below fixation of the round ligaments to the body (reduced in size) of the uterus (slowly absorbable catgut).

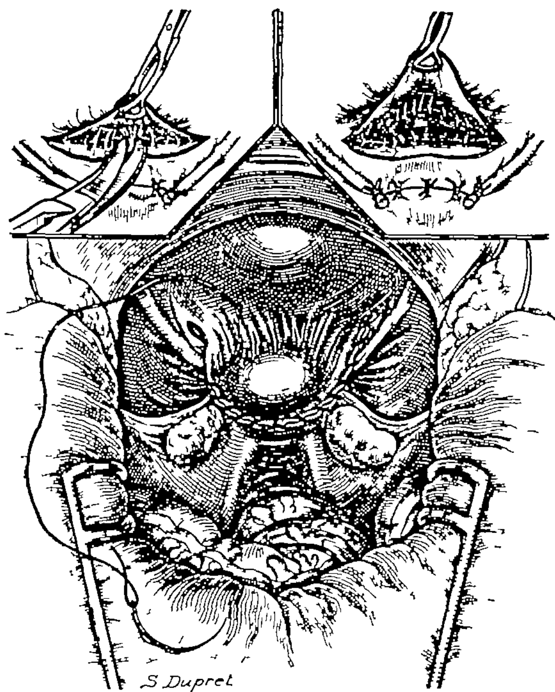
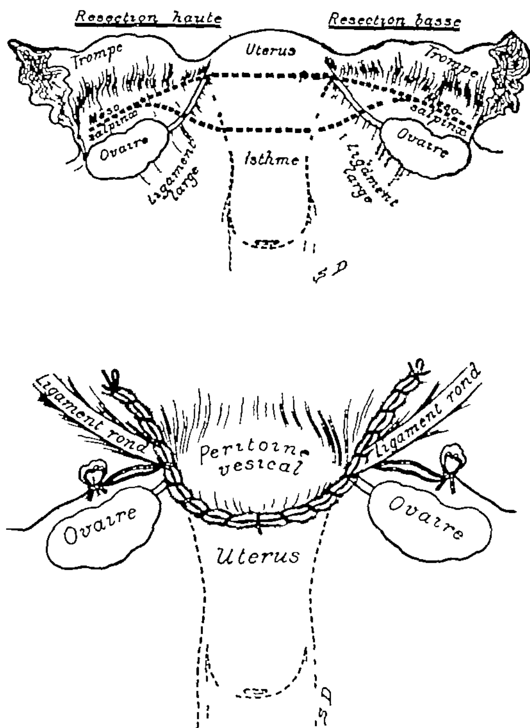


FIG 264.—HYSTERECTOMY OF THE FUNDUS.

The scissors free the vesical peritoneum in front of the uterus. Above and to the right, the vesical peritoneum is mobilised. The reader sees the top of the bladder at the bottom of the wound. Below peritoneal continuous suture uniting the mobilised vesical peritoneum to the peritoneum of Douglas pouch. In the centre of the same figure, the protrusion formed by the smaller fundus of the uterus is seen.



FIGS 265 AND 266.—HYSTERECTOMY OF THE FUNDUS.

Drawings showing what the operator may remove of the uterus and of the adnexa in hysterectomy of the fundus. The upper dotted line shows what is often sufficient to remove. The lower dotted line shows the maximum portion that can be removed if we desire to preserve the menstrual function.

Résection haute = High resection. *Résection basse* = Low resection *Trompe* = Tube *Utérus* = Uterus *Méso-salpinx* = Meso-salpynx. *Ovaire* = Ovary *Isthme* = Isthmus *Ligament large* = Broad ligament *Ligament rond* = Round ligament *Péritoine vésical* = Peritoneum of the bladder

XII

TREATMENT OF PROLAPSE OF THE GENITALS IN OLD WOMEN BY CLOSURE OF THE VAGINA
(Operation of LE FORT)

THE indication for operation for prolapse of the genitals varies according to the age

(a) *In young women* coitus and pregnancy must be considered

(b) *In women of mature age* (after the menopause) only the question of coitus has to be thought of

(c) *In old women*, when coitus and pregnancy require no consideration, there is no disadvantage in closing the vagina

The majority of causes of failure in young women are due to relaxation of the perineal muscles, which can be treated previously and subsequently to the operation by exercising the levatores, recurrences are due either to faulty technique or to weakness of the perineal muscles In order to succeed therefore, the gymnastic exercises of Thuré Brandt must be imposed When the muscles of the pelvis and of the perinæum have been renewed by exercises, the sutures hold better

We will only concern ourselves at the present time with the treatment of prolapse of the genital organs in old women.

We have employed all the methods possible—hysteropexy combined with perineorrhaphy total colpectomy with or without previous hysterectomy, and finally closure of the vagina

We have given up total colpectomy for we have observed after it a case of pyometritis in a woman of sixty six years afterwards we had to perform abdominal hysterectomy The strong and thin patient was cured

It can be said, in a general way in old women closure of the vagina is the method of choice because there is no risk to the patient Success is certain, general anæsthesia is unnecessary, it is therefore, the ideal operation owing to its simplicity and mildness

Pre-Operative Precautions.—The cervix is generally ulcerated the vagina must be disinfected For this purpose we need only reduce the uterus permanently and tampon with compresses

soaked in gomenol oil Cicatrisation may require many weeks During this time it is necessary to pack the vagina well, and to retain the tampon in position with a diaper, or keep the patient in bed If for some reasons we wish to operate before complete cicatrisation of the vagina, the ulceration must be excised at the time of the operation, and the vagina rubbed with ether and tincture of iodine It is better to wait spontaneous cicatrisation from the dressings

The age of the patient is no contra indication, since the operation is an extremely mild one But operation should not be performed in patients affected with mental symptoms, with ulceration of the buttocks, or with advanced myocarditis These cases are exceptional Moreover, the *question of operation does not practically* present itself in patients with these morbid conditions

Anæsthesia.—Local anæsthesia can be produced by infiltration into the submucosa, or for preference by trans-sacral or epidural injection The anæsthesia lasts generally an hour which is more than necessary, since the operation lasts from fifteen to thirty minutes

Operation.—It is very easy of execution if the prolapse be complete, less easy if the uterus cannot be entirely brought down

(*A*) Cutting the Flaps —The object of the surgeon is to cut two rectangular flaps of equal length, one on the anterior and the other on the posterior surface of the vagina, bring the two surfaces together, and suture the one to the other so as to close the vagina There will remain, therefore on the right and the left a band of about 1 centimetre of vaginal mucosa The incision should begin below, about 1 centimetre below the cervix, and stop above 1 centimetre from the urethral meatus and the fourchette

The flaps are made in this way The surgeon catches the posterior flap of the cervix with tissue forceps, and with a tampon soaked in ether rubs vigorously the whole surface of the vagina and of the vulva, without omitting a single fold He introduces *into the uterus, without curetting* it, a tampon soaked in tincture of iodine If ulceration still exist he again applies the iodine after rubbing it with ether If the ulceration be too extensive it is not sufficient to curette it it must be excised by the knife and the hæmorrhage stopped by a tampon The flaps should not be cut close to the cervix, there should be a free space between the uterine orifice and the closure of the vagina so that if secretions

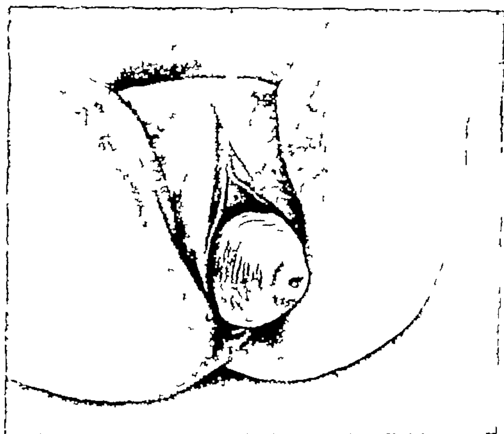


FIG 267.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

Appearance of a complete prolapse, such as is usually seen. The cervix is cicatrized by the dressings and by reduction.

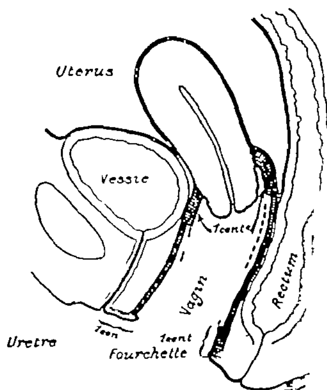
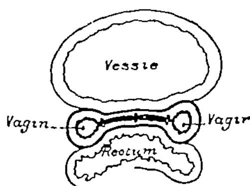


FIG. 268.—TREATMENT OF PROLAPSE OF THE GENITAL OR...

Drawing of the vagina which shows the piece of the mucosa ... on each wall. The excision stops 1 centimetre from the ... metre from the fourchette behind it does not infringe on t...

Uterus = Uterus *Vessie* = Bladder 1 *cent.* = 1 centimetre ... = Rectum *Uretre* = Urethra *Fourchette* = F...



Muqueu vagina ... ale

FIG. 269.—TREATMENT OF PROLAPSE OF THE GE...

These two drawings show above the vaginal ... right and left the healthy mucosa, which forms ... below shows the raw vaginal wall, sutured by ... line right and left the vaginal canals, which ... membrane.

Vessie = Bladder *Vagin* = Vagina *Muqueuse* ... *Rectum* = Rectum

Col utérin = Cervix uteri *Muqueuse vaginale* = Vaginal mucosa ... Fourchette *Limite du lambeau muqueux postér* = Boundary of the posterior mucous flap

Col utérin =

2...—TREATMENT OF PROLAPSE OF ... OLD WOMEN

Appearance of the anterior raw surface.

Muqueuse = Mucosa. *Musculeuse* = Muscular tissue ... Cervix uteri.

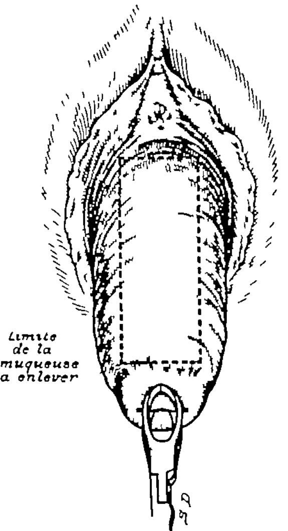


FIG. 270.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

How the uterus is fixed with tissue forceps to make the anterior vaginal flap.

Limite de la muqueuse à enlever—Extent of the mucosa to be removed

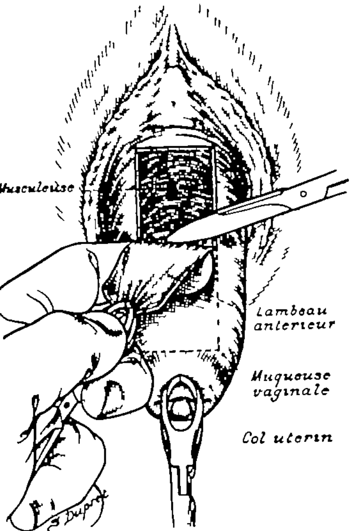


FIG 271.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

How the anterior vaginal flap is cut.

Musculeuse—Muscular layer *Lambeau antérieur*—Anterior flap *Muqueuse vaginale*—Vaginal mucosa *Col utérin*—Cervix uteri

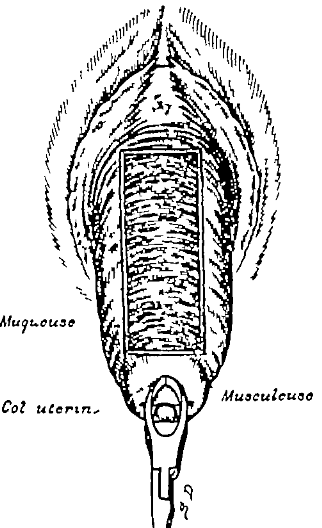


Fig. 272.—Treatment of Prolapse of the Genital Organs in Old Women

Appearance of the anterior raw surface.

Muqueuse = Mucosa. *Musculeuse* = Muscular tissue *Col utérin* = Cervix uteri.

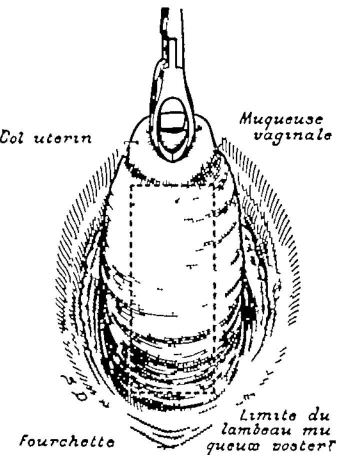




Fig 273—Treatment of Prolapse of the Genital Organs in Old Women

How the uterus is fixed to cut the *posterior vaginal flap*.

Col utérin = Cervix uteri *Muqueuse vaginale* = Vaginal mucosa *Fourchette* = Fourchette *Limite du lambeau muqueux postérr* = Boundary of the posterior mucous flap

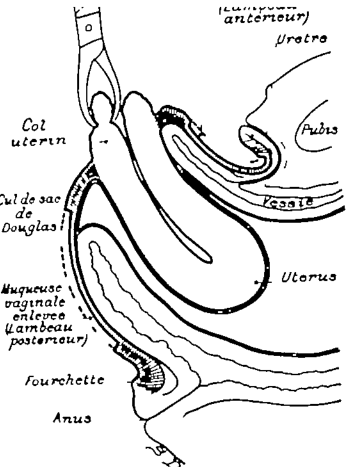


FIG 274.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

Drawing showing the appearance of the vagina after the anterior and posterior flaps have been cut. Note the position of the bladder of the rectum, and of the peritoneum.

Col utérin = Cervix uteri *Muqueuse vaginale enlevée (Lambeau antérieur)* = Vaginal mucosa removed (anterior flap) *Urètre* = Urethra. *Pubis* = Pubis *Cul-de-sac de Douglas* = Douglas pouch *Vessie* = Bladder *Muqueuse vaginale enlevée (Lambeau postérieur)* = Vaginal mucosa removed (posterior flap) *Utérus* = Uterus *Fourchette* = Fourchette *Anus* = Anus

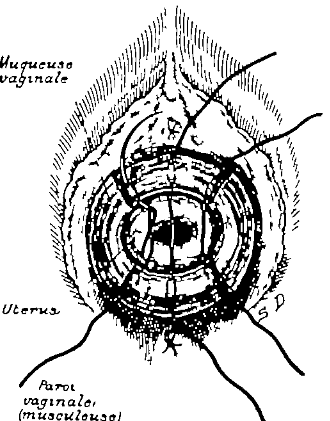


FIG. 275.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

Closure of the vagina. How the vaginal walls are brought into apposition. Three stitches of slowly absorbable catgut are passed by a sharp curved needle. None of the threads pierce the mucosa; directly they are tied the cervix should be hidden the secretions should be able to discharge by the right and left vaginal canals.

Muqueuse vaginale = Vaginal mucosa *Utérus* = Uterus *Paroi vaginale (musculeuse)* = Vaginal wall (muscular tissue)

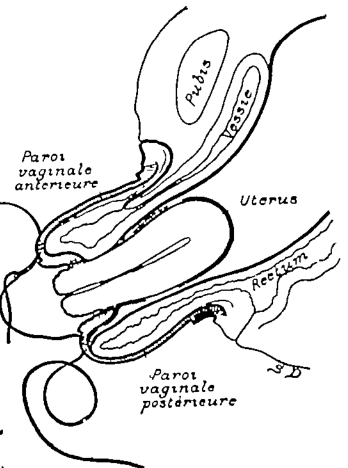


Fig 276.—Treatment of Prolapse of the Genital Organs in Old Women

Drawing showing the position of the first threads, corresponding to Fig 27[illegible]

Pubis = Pubis *Vessie* = Bladder *Paroi vaginale antérieure* = Anterior vaginal wall *Utérus* = Uterus *Rectum* = Rectum *Paroi vaginale postérieure* = Posterior vaginal wall

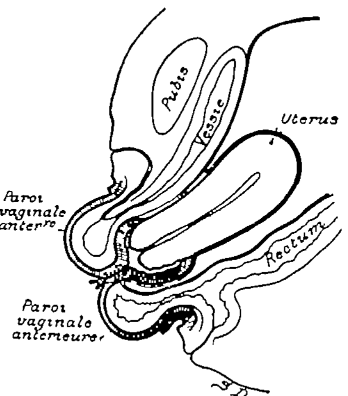


Fig 277.—Treatment of Prolapse of the Genital Organs in Old Women

Drawing showing the position of the cervix uteri, after closure of the first level of suture (three stitches)

Pubis = Pubis *Vessie* = Bladder *Utérus* = Uterus *Paroi vaginale antérre.* = Anterior vaginal wall *Rectum* = Rectum *Paroi vaginale postérieure* = Posterior vaginal wall

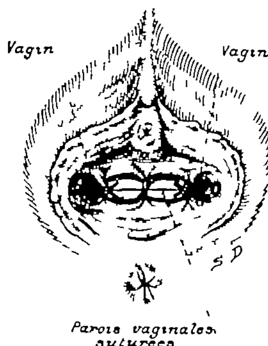


FIG 278.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

Last level of suture, which corresponds to the vulva of each side the vaginal canals covered by healthy mucosa they allow of the discharge of any existing uterine secretions.

Vagin — Vagina. *Parois vaginales suturées* — Vaginal walls sutured.

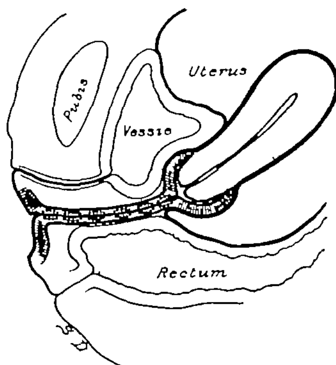


FIG 279.—TREATMENT OF PROLAPSE OF THE GENITAL ORGANS IN OLD WOMEN

Appearance of the sutured vagina.

Pubis — Pubis *Uterus* — Uterus *Vessie* — Bladder *Rectum* — Rectum